

Before the
Federal Communications Commission
Washington, D.C. 20554

PR Docket No. 90-480

In the Matter of

Amendment of Parts 13 and 80 of the
Commission's Rules to implement
the Global Maritime Distress and
Safety System (GMDSS) to improve the
safety of life at sea.

**REPORT AND ORDER
(Proceeding Terminated)**

Adopted: January 16, 1992; Released: February 7, 1992

By the Commission: Commissioner Marshall not
present.

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I. INTRODUCTION

1. This *Report and Order* implements the Global Maritime Distress and Safety System (GMDSS) in the Commission's Maritime Service Rules substantially as proposed. By this action, we adopt the requirements of the international Safety of Life at Sea (SOLAS) Convention for large oceangoing U.S. vessels. These requirements will be phased in during the 1992 to 1999 time period.

II. BACKGROUND

2. The GMDSS represents the biggest improvement in marine safety since the first maritime regulations were enacted following the sinking of the *Titanic* in 1912. It is an automated ship-to-shore distress alerting system that relies on satellite and advanced terrestrial systems. By incorporating these advanced communications techniques into the safety system and using ship-to-shore communications links, the GMDSS will significantly improve safety of life and property at sea throughout the world.¹ It represents more than a decade of work by the International Maritime Organization (IMO) and the International Telecommunication Union (ITU).² In November 1987, the ITU adopted GMDSS associated revisions to the Radio Regulations. *See*, Final Acts of the World Administrative Radio Conference for Mobile Services (MOB-87), Geneva, 1987. In November 1988, the IMO adopted amendments to the 1974 SOLAS Convention to implement the GMDSS internationally. *See*, Final Acts of the Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974, on the Global Maritime Distress and Safety System, London, 1988 (GMDSS Amendments). In October 1990, we proposed to

¹ The advent of satellite and automated terrestrial communications systems offers important advantages for distress and safety communications. The current distress and safety system is primarily a manual, ship-to-ship system that relies on Morse code radiotelegraphy on 500 kHz and voice radiotelephony on 2182 kHz and 156.8 MHz. Its effectiveness depends on the location of the nearest vessel, propagation conditions, and the technical proficiency of the radio officer. Under the GMDSS, licensed

radio operators on board GMDSS-equipped ships will use modern radio equipment to send distress alerts over long distances with assurance that they will be received on shore.

² The IMO and the ITU are both agencies of the United Nations. The IMO specifies regulations for the maritime service, such as equipment carriage requirements for certain classes of ships. The ITU specifies regulations for radio matters, such as operating procedures and frequency allotments.

adopt the international GMDSS provisions for U.S. vessels in a *Notice of Proposed Rule Making (Notice)*, PR Docket No. 90-480, 5 FCC Rcd 6212 (1990).

3. Parts 13 and 80 of the Commission's Rules currently specify the radio operator licenses and the radio equipment requirements for U.S. vessels. They are based on international requirements contained in the 1974 SOLAS Convention and similar domestic requirements delineated in the Communications Act of 1934, as amended (Communications Act), 47 U.S.C. §§ 351-364. Ships subject to either the SOLAS Convention or the Communications Act are required to carry certain radio equipment and personnel for safety purposes. These ships are termed "compulsory" ships. In the *Notice*, we proposed revising our requirements for compulsory radio-equipped ships to reflect the international GMDSS provisions.³ An extension of time to file comments and reply comments was granted on December 24, 1990. *Order*, PR Docket No. 90-480, 6 FCC Rcd 6 (1990). The comment period closed on June 7, 1991, and the reply comment period closed on July 6, 1991. We received twenty-two comments, seven reply comments, and two *ex parte* comments.⁴ (Appendix A lists the commenters.)

III. DISCUSSION

4. We will begin our discussion with a brief description of the GMDSS outlining its differences from the present maritime distress communications system. We will also clarify the relationship of the SOLAS Convention and the Communications Act, and consider the general issue of whether to adopt the GMDSS for U.S. vessels. We will then address the controversial matters concerning the radio operator and equipment maintenance issues. Finally, we will discuss the operational and technical issues relating to satellites, terrestrial systems, and equipment performance requirements.

A. GMDSS Implementation

5. The GMDSS is primarily a ship-to-shore system, though it retains ship-to-ship capability.⁵ The GMDSS consists of several communication systems, some of which are new, but most of which have been in operation for several years. The COSPAS-SARSAT satellite system, which has been in operation since 1982, provides distress alerting using the 406 MHz emergency position-indicating radiobeacon (406 MHz EPIRB).⁶ The International Maritime Satellite Organization's (INMARSAT) maritime mobile satellite system has also been in operation since 1982

and forms a major component for distress alerting and communications. In addition to satellites, new automated terrestrial data systems and existing systems are combined into one overall communications system. The GMDSS will provide for new digital selective calling (DSC) services on high frequency (HF), medium frequency (MF), or very high frequency (VHF) bands depending upon the location of the ship in distress. These new DSC services will be used for ship-to-ship, ship-to-shore, and shore-to-ship automatic alerting, while existing terrestrial HF, MF, and VHF radiotelephony equipment provides distress, urgency, and safety related communications. The GMDSS will enhance search and rescue (SAR) operations through the use of the new 9 GHz search and rescue transponder (SART). Finally, it will create a global network for the dissemination of maritime safety information (MSI) using three systems: NAVTEX, IMMARSAT enhanced group calling (EGC), and HF narrow-band direct-printing (NBDP) radiotelegraphy.

6. The two most notable features of the system are that it is based on sea areas of operation and that it offers multiple communications options. The first of these features, sea area basing, divides the seas into four-communications areas. Sea Area A1 is the area within VHF radiotelephone coverage of at least one coast station at which continuous DSC is available (approximately 20-30 miles). Sea Area A2 is the area within MF radiotelephone coverage of at least one coast station at which continuous DSC is available (approximately 75-150 miles), excluding Sea Area A1. Sea Area A3 is the area within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available (approximately 70° North to 70° South), excluding Sea Areas A1 and A2. Sea Area A4 is the remainder of the seas of the world (essentially the polar regions) and relies primarily on HF communications. Sea areas are established by individual countries, which equip their shore stations with appropriate VHF, MF, HF or satellite facilities to "cover" particular segments of ocean.⁷

7. The second significant feature of the GMDSS, multiple communications options, ensures that each ship using the GMDSS will have at least two options of distress alerting appropriate to its sea area. This redundancy will minimize the chance that a ship in distress will be unable to communicate because of weather, radio propagation difficulties, equipment failure, or other circumstances. This feature represents a significant improvement over the

³ The *Notice* stated that the proposed rules addressed compulsory ships. It defined "compulsory ships" as cargo ships 300 tons gross tonnage and over and all passenger ships that carry more than twelve passengers regardless of their size, as specified in the SOLAS Convention or Title III, Part II of the Communications Act. See *Notice, supra*, at para. 21.

⁴ Additionally, we received a letter signed by Thomas C. Harper, president of the Radio-Electronic Officers Union (ROU), stating that comments filed in the name of the ROU and bearing Lewis D. Smith's signature were not authorized by the ROU Executive Board. ROU indicates that the filing does not represent ROU's views and requests that the filing be "expunged from the files of the FCC...." Thus, we have not considered the disputed comments, as requested by ROU.

⁵ This section contains a very brief overview of the GMDSS. A more detailed description of the GMDSS is contained in the

Notice. See *Notice, supra*, at paras. 8-20. Additionally, a simplified diagram of the GMDSS radiocommunication systems is presented in Appendix B.

⁶ COSPAS-SARSAT is a joint international satellite-based search and rescue system established by Canada, France, USSR, and the United States to locate emergency radiobeacons transmitting on 121.5 MHz and 406 MHz. The U.S. satellites in this system also receive on 243 MHz.

⁷ For example, a shore station must add VHF-DSC equipment to establish an A1 sea area for a particular geographic region. IMO has delineated the various sea areas, both established and planned, in the Master Plan of Shore-based Facilities for the GMDSS (Master Plan). See IMO COM 37/WP. 2, July 10, 1991.

current distress system. A comparison of the primary features of the current distress and safety system and the GMDSS is given below.

CURRENT DISTRESS & SAFETY SYSTEM

Primarily a ship-to-ship system

Radio equipment requirements determined by size of ship

Nominal communications range is approximately 150-200 miles

Communications quality depends upon propagation conditions

Manual watch on distress frequencies required

Morse code skilled radio officer is required on ships >1600 tons

Different requirements for ships of different sizes

GMDSS

Primarily a ship-to-shore system

Radio equipment requirements determined by area of ship operation

Communications range can be worldwide for ships using HF or satellites

Communications quality improved by use of satellites and multiple frequency digital data transmissions

Automatic watch on distress frequencies

Licensed radio operator required on all ships

All ships over 300 gross-tons and all passenger ships are subject to identical requirements

8. The basic concept of the GMDSS is that SAR authorities on shore, as well as shipping in the immediate vicinity of the ship in distress, can be rapidly alerted to a distress incident. The shore-based authorities designated as a Rescue Coordination Center (RCC) can then assist in coordinating rescue operations with minimal delay. In the United States, the Coast Guard is the designated maritime SAR organization and will operate the necessary RCCs. The particular GMDSS equipment used to communicate varies by sea area and may have several alternatives. The following is a simplified chart of GMDSS equipment and its primary functions assuming a mid-ocean distress situation:

Shipboard radio equipment

Function

406 MHz EPIRB

Ship-to-shore alerts via COSPAS-SARSAT

VHF radio (DSC and voice)

SAR communications

MF radio (DSC and voice)

Ship-to-ship alerts and communications

INMARSAT ship earth station (SES) plus EGC capability*

NAVTEX receiver

9 GHz SART

Two-way VHF portable radios

2182 watch receiver/auto alarm

Ship-to-shore alerts, communications, and MSI (SafetyNet)

MSI (518 kHz)

SAR locating beacon

SAR communications

Receipt of 2182 kHz alerts until 1999

*Alternatively, a HF radio (DSC, voice, and NBDP) which includes a HF-DSC watch receiver may be used in lieu of the INMARSAT SES/EGC terminal. The HF radio is required for sea area A4.

9. By the terms of the SOLAS Convention, the GMDSS provisions apply to cargo ships of 300 tons gross tonnage and over and ships carrying more than twelve passengers traveling on international voyages. Title III, Part II of the Communications Act sets forth radio provisions that apply to these same ships when traveling in the open sea. Because the same radio requirements are currently specified for these ships for both international and domestic voyages, we proposed to adopt the GMDSS provisions for ships subject to either the SOLAS Convention or Title III, Part II of the Communications Act. Thus, this proceeding addresses cargo ships of 300 tons gross tonnage and over when traveling on international voyages or in the open sea, and to all passenger ships irrespective of size when traveling on international voyages or in the open sea. We will refer to these ships as compulsory ships, as defined in paragraph 3 above, or simply as GMDSS ships.

10. The SOLAS Convention specifies, and we proposed, the following implementation dates:⁸

February 1, 1992 voluntary compliance, any ship may be GMDSS-equipped

August 1, 1993 all compulsory ships must have satellite EPIRB and NAVTEX

February 1, 1995 newly constructed compulsory ships must be GMDSS-equipped

February 1, 1999 all compulsory ships must be GMDSS-equipped

11. In response to the *Notice*, several commenters advocate retention of the current requirements either permanently or until February 1, 1999. Generally, they wish to retain the requirement for radio officers or delay implementation of the GMDSS in the United States. Many of the radio officers also want to retain the carriage requirements for manual Morse code radiotelegraphy on 500 kHz, essentially opposing any change. We have considered all arguments carefully and emphasize that the implementation of the GMDSS is mandated by the SOLAS Convention, to which the United States is signa-

⁸ The GMDSS implementation dates are summarized in Appendix C.

tory.⁹ Thus, we have treaty obligations to enact certain GMDSS provisions as early as August 1993. The remaining provisions must be enacted for new ships by 1995, and for existing ships by 1999. The SOLAS Convention also permits ships to voluntarily comply with the GMDSS in lieu of the current manual Morse code system as early as February 1, 1992. We agree with this schedule for U.S. ships, although U.S. ships cannot eliminate the current manual radiotelegraphy system and radio officers until changes to the Communications Act are adopted. The GMDSS represents more than a decade of development by the IMO. The GMDSS offers significant advantages over the current system, and the United States has been a strong advocate of the GMDSS internationally. It was unanimously adopted by 66 countries representing the world maritime community. Moreover, if U.S. vessels are delayed in implementing the GMDSS, American lives and property could be at risk by perpetuating an outmoded ship-to-ship system that is less able to communicate with ships and shore facilities of the major maritime nations.¹⁰ Although some commenters claim that the GMDSS should be delayed because there are insufficient RCCs and SAR facilities in many parts of the world for the shore-based system to be effective, this is not a sound argument. IMO considers these facilities to be adequate, and, furthermore, even a distant RCC can coordinate rescue resources and efforts for a ship in distress. Compared to a ship equipped under the current distress and safety system, the GMDSS will enhance a ship's ability to communicate during a distress by ensuring multiple communications options. We therefore conclude that adoption of the GMDSS is in the public interest and it should not be delayed. Comments regarding radio personnel and equipment requirements for GMDSS ships were examined and many changes have been incorporated where appropriate.

B. Radio Operators and Radio-equipment Maintenance

12. Radio operators and radio-equipment maintenance proved to be the two most controversial issues addressed in comments. In the *Notice*, we proposed to follow the GMDSS provisions as prescribed by the IMO Conference:

- For radio operations, GMDSS ships must carry personnel qualified for distress and safety radiocommunications purposes. The personnel

should be holders of certificates specified in the Radio Regulations as appropriate,¹¹ any one of whom shall be designated to have primary responsibility for radiocommunications during distress incidents.

- For radio maintenance, the availability of the functional requirements of the radio equipment must be ensured by using such methods as duplication of equipment, shore-based maintenance, or at-sea maintenance, or a combination of these methods (two of these three methods are required in sea areas A3 and A4).

13. Specifically, we proposed that each GMDSS ship have at least one qualified radio operator who holds a GMDSS-endorsed license issued by the Commission, and that a qualified GMDSS operator must be designated to act as a dedicated communications operator in cases of distress. Because GMDSS ships are not equipped with manual Morse code telegraphy equipment, they would not be required to carry radio officers.¹² We also proposed the flexible approach to maintenance enacted by the IMO. IMO regulations allow ship owners the option of choosing among shore-based maintenance, duplication of equipment, and at-sea maintenance. Ships operating in sea areas A3 and A4 would be required to use two of these methods. We requested comments on whether a certificate is needed for the at-sea maintainer to ensure the functioning of equipment during a distress situation. *See Notice* at paras. 40-41.

14. The American Radio Association (ARA), all "individual radio officers"¹³ that commented, and three other commenters oppose the GMDSS generally and insist that each ship must have an individual capable of performing on-board maintenance and emergency repairs of radio equipment. *See, e.g.,* comments of ARA at 1-4, Spencer at 1, Reno at 6, Zbrozek at 3, and Phelps at 1-2. Some also argue that shore-based maintenance and duplication of equipment are not viable options. *See, e.g.,* Reno comments at 7. ARA argues that technological advances like the GMDSS have not removed the need for trained shipboard radio officers/radio electronics officers (RO/REO). It states that a trained and dedicated communications specialist is essential to ensure emergency communications during maritime accidents. ARA *ex parte* comments at 1. Marine Communications, Inc. (MC) ech-

⁹ Several commenters, arguing for continuation of the current distress and safety system, indicate that U.S. vessels should continue to abide by the SOLAS Convention. We emphasize that the GMDSS requirements *are* the actual SOLAS Convention provisions. The 1988 Amendments to the SOLAS Convention implementing the GMDSS received acceptance on February 1, 1990, and enter into force on February 1, 1992. The SOLAS Convention simply allows the current system to remain in effect for existing ships until 1999.

¹⁰ Many countries, such as Norway, Finland, and Canada, have already enacted regulations requiring their ships to convert to the GMDSS. Canada requires their existing ships to meet GMDSS requirements by 1995, rather than the permitted international deadline of 1999.

¹¹ Because the United States took reservations on the revisions to Radio Regulations, Articles 55 and 56, which set forth the radio operator certificates, we proposed qualifications based on the Radio Regulations' "operator certificates" rather than the

"electronics certificates" (*i.e.*, the General Operator's and Restricted Operator's Certificates versus the First or Second Class Radio Electronic Certificates). *See Notice* at para. 39-40.

¹² Generally, radio officers have the specialized skills necessary to operate manual Morse code radiotelegraph equipment while radio operators have the general knowledge to operate simpler radio equipment, such as radiotelephone (voice), NBDP, and facsimile. Under the Communications Act, ships equipped with radiotelegraphy installations must carry radio officers. Both radio officers and radio operators are tested and licensed by the Commission. Radio officers, when employed to operate radiotelegraph equipment on compulsory ships, are also licensed by the Coast Guard.

¹³ Several commenters identified themselves as radio officers or former radio officers. Other individuals presenting similar views did not identify their background. All noted that their comments were prompted by a desire to improve maritime safety and not for individual gain. Collectively, we will refer to them as "individual radio officers."

oes this concern and claims that communications will become secondary to other duties, such as fire fighting, etc., during emergency situations. MC comments at 36. Several commenters refer to a number of emergency and distress occurrences aboard merchant vessels, arguing that the GMDSS will be less safe than the current system if ships are allowed to sail without radio officers. See, e.g., comments of Russell, Phelps, and ARA (regarding a fire aboard M/V *Green Lake* in 1989, where a distress message sent via satellite went unanswered). Finally, ARA argues that we failed to consider the evolving role of the RO/REO as an equipment maintainer and the need for qualified electronics experts on ships which increasingly rely on computerized equipment for navigation, propulsion, and communications systems. ARA comments at 29.

15. The Coast Guard, the Radio Technical Commission for Maritime Services (RTCM), the American Institute for Merchant Shipping (AIMS), and seven others strongly support implementation of the GMDSS in the United States and urge that we allow all three methods of maintenance permitted by IMO. They argue that an individual certified in radio operations is sufficient unless the at-sea maintenance option is elected. AIMS states that the multiple operator concept of the GMDSS is superior to the present reliance on a single individual. AIMS comments at 3. It notes that, according to the proposed rules, a certified individual must be available to act as a dedicated communications operator during cases of distress.¹⁴ See, *Notice*, § 80.1073(c). AIMS also disagrees with the view that radio officers are capable of making all shipboard repairs, noting that because of the variety of radio equipment aboard GMDSS ships, an at-sea maintainer could not be expected to perform the in-depth trouble shooting needed in repairing all pieces of GMDSS radio equipment. AIMS comments at 7-8. AIMS states that duplication of equipment is "by far the preferred alternative." AIMS comments at 2. In addition to being the preferred "spare part" for on-board maintenance, duplication provides immediate backup communications. AIMS supports shore-based maintenance also, noting that it provides specially-trained technicians, a wide range of spare parts, and the replacement of equipment. See AIMS comments at 2. In reply to the M/V *Green Lake* incident, the Coast Guard indicates that the *Green Lake's* distress message did not go unanswered but was forwarded to the Japanese Maritime Safety Agency, which was the responsible RCC for that area. The Coast Guard argues that although the distress message should have been acknowledged, the incident does not indicate that the existing system is better than the GMDSS. The Exxon Communications Company (Exxon) denies that radio officers would have made any difference in the incidents cited regarding Exxon ships, stating that the two situations cited aboard its vessels were problems in the engine room which were handled by electricians or engine room engineers, not radio officers. See Exxon comments at 4.

(1) Radio personnel and maintenance options aboard GMDSS ships

16. The comments in support of the GMDSS state that a qualified radio operator who would be dedicated to radiocommunications in cases of distress is sufficient for communications aboard GMDSS ships. They further argue that all three maintenance methods are viable, that this position was unanimously agreed upon by the international maritime community, and that we should not alter this approach. The comments in opposition state that radio officers are critical to the safe operation of oceangoing ships. They argue that radio officers are needed to perform electronics maintenance and to ensure the availability of qualified radio operators during distress situations.

17. We are not persuaded by the comments to deviate from the GMDSS requirements prescribed by the SOLAS Convention.¹⁵ First, radio officers are not needed aboard GMDSS ships for manual Morse code telegraphy operations and watchkeeping requirements. GMDSS ships have alternate means of alerting and are not required to have Morse code telegraphy equipment. Second, we disagree that radio officers are necessary to ensure that qualified operators are available for communications during a distress situation. A licensed GMDSS radio operator must demonstrate knowledge of the operation of GMDSS equipment and the emergency procedures for distress communications. We examined the comments regarding at-sea emergencies. In situations like those described, a GMDSS radio operator would be capable of communicating with other ships and shore-based RCCs. Further, under the proposed requirements, a GMDSS-qualified radio operator must be designated to act as a dedicated communications operator in cases of distress. To ensure that this person is available for this duty, we agree with the Coast Guard's proposal that the designated emergency GMDSS operator, and a backup, be posted as part of the ship station bill.¹⁶ Designating a backup will enhance safety by providing for more than one qualified radio operator on GMDSS ships. We have also included in the rules RTCM's suggestions that clarify the radio operators' responsibilities. See RTCM comments at 29-30. Finally, we disagree with the argument that we failed to recognize the evolving role of the radio officer as a maintainer of radio electronics equipment. As part of our proposal we outlined various options for radio maintenance including qualifications for at-sea radio maintainers, which we will now discuss.

18. The crux of the maintenance issue is whether at-sea maintenance should be mandatory rather than optional. We conclude that it need not be mandatory to ensure the availability of radiocommunications during a distress situation. At-sea maintenance is not the only means to ensure maritime safety under the GMDSS provisions. Duplication of equipment and shore-based maintenance are at least as viable as, if not more viable than, at-sea main-

¹⁴ The Coast Guard proposes that vessels must have a plan indicating who would be designated responsible for communications in an emergency (and who would be designated as backup), that the designated persons are properly certified and trained, and what other duties, if any, these persons would have during an emergency. See Coast Guard reply comments at 5.

¹⁵ Although some comments refer to RO/REOs, there is no requirement in the SOLAS Convention, the Communications Act, or the Commission's Rules for ships to carry REOs. Arti-

cles 55 and 56 of the ITU Radio Regulations, to which the United States took reservations, refers to personnel holding First or Second Class Radio Electronics Certificates, not REOs.

¹⁶ We note that the rules indicate that during a distress the radio operator function is primary and must be attended to before any additional duties. We see no reason to require delineation on the ship station bill of duties not related to radiocommunications. Delineation of their other duties is acceptable but not required by our rules.

tenance.¹⁷ All GMDSS ships must have two pieces of equipment using two separate communications systems for ship-to-shore alerting, but those ships using the duplication option must have at least three pieces of equipment for ship-to-shore alerting. Thus, duplication of equipment greatly enhances safety of life at sea. Further, ships sailing in sea areas A3 and A4 (*i.e.*, most subject U.S. vessels) cannot rely on duplication alone but must use either shore-based or at-sea maintenance also. Although some commenters criticize shore-based maintenance, we believe it is a viable option. The extensive use of integrated circuitry and microprocessors in modern communication equipment makes shore-based maintenance a natural complement to duplication or at-sea maintenance. Lack of extensive technical knowledge and limited spare parts and test equipment restricts at-sea maintenance from ensuring communications during distress situations. At-sea maintenance, however, should not be excluded as a maintenance option. We are adopting the flexible approach to maintenance adopted by IMO. We are also adopting the IMO Guidelines for Maintenance into the Commission's Rules.¹⁸ These guidelines have been fully considered internationally, approved by the IMO, and supported by comments. Although some commenters argue that ships would leave port before repairs were completed, we emphasize that this would be a violation of the rules. The rules state that a ship must be capable of performing all distress and safety communications throughout its entire voyage. Additionally, we are incorporating changes to the proposed rules to clarify the GMDSS radio maintenance requirements for U.S. vessels.¹⁹

19. For these reasons, we are adopting rules requiring GMDSS ships to carry a GMDSS-qualified radio operator having primary responsibility for radiocommunications

during distress situations. Additionally, as proposed by the Coast Guard, each ship must also carry a second GMDSS-qualified radio operator for backup purposes. We conclude that while manual Morse code trained radio officers have played a critical role in the safe resolution of distress situations in the past, the GMDSS will be more effective in communicating in distress situations than the current system, and the features of the GMDSS eliminate the need for manual Morse code equipment, and thus the carriage of radio officers. The GMDSS system still requires the carriage of a licensed, proficient radio operator. We also find adoption of three maintenance options to be in the public interest, because this will allow U.S. vessels the same flexibility provided by the international community while ensuring that ships can communicate during distress situations.²⁰ For ships using either duplication or shore-based maintenance options, a certified GMDSS radio operator is sufficient for safety communications requirements. In accordance with IMO provisions, the maintainer could be a person other than the radio operator, and neither the maintainer nor the radio operator need be a radio officer.²¹

(2) Certification of radio operators and at-sea maintainers

20. In the *Notice*, we proposed that the Commission test and issue a GMDSS endorsement which would be affixed to the existing First or Second Class Radiotelegraph Operator's Certificate (T-1 or T-2), General Radiotelephone Operator License (G), or Marine Radio Operator Permit (MP) after an operator demonstrated satisfactory knowledge of GMDSS practices and procedures. We requested comments on whether T-1 or T-2 radio operators who have six month endorsements may be grandfathered or

¹⁷ Duplication of equipment is not equivalent to complete redundancy. There is no requirement that ships carry "two sets of everything." The IMO has adopted guidelines that set out the additional radio installations required under the duplication of equipment option. See IMO Assembly Resolution on Radio Maintenance Guidelines for the Global Maritime Distress and Safety System related to Sea Areas A3 and A4 (hereafter "IMO Guidelines for Maintenance"). These guidelines ensure that ships using duplication of equipment have a second radio to replace each basic radio for all functions critical to distress and safety communications.

¹⁸ We are not adopting, however, the IMO provision that states "for ships operating in sea area A4 *only occasionally* and having originally installed an MF/HF radio installation, the additional MF/HF radio installation may be substituted by an INMARSAT-SES radio installation." See IMO Guidelines for Maintenance, Section 2.2 of Annex (emphasis added). Although permitted by the IMO, we believe that this provision does not adequately ensure backup communications, because INMARSAT does not cover the sea area A4.

¹⁹ As suggested by comments, the rules clarify the GMDSS radio operators' duties and specify that the equipment must be operational before the ship leaves port. They also require that GMDSS ships carry adequate spare parts and copies of the IMO Master Plan. See comments of RTCM at 28 and 44 and Coast Guard at 9. We have not incorporated the Coast Guard's suggestion that ships electing duplication of equipment must carry HF equipment as the replacement for INMARSAT-SES, and INMARSAT-SES as the replacement for HF equipment. The Coast Guard states that this would eliminate dependence upon one system. Coast Guard comments at 4. (IMO allows for this substitution of equipment but does not require it.) We find that the Coast Guard has not provided sufficient justification to

impose this stringent requirement on vessels using the duplication of equipment option. It exceeds IMO requirements and limits flexibility for ships choosing the duplication of equipment option. It also necessitates that ships carry additional tools, spare parts, and technical information for maintaining differing sets of equipment. Finally, if reliance on INMARSAT or HF systems alone is adequate for ships choosing on-board or shore-based maintenance options, then reliance on either INMARSAT or HF systems should be sufficient for ships choosing duplication of equipment. Thus, we will permit the substitution of INMARSAT and HF equipment as allowed by IMO for ships choosing duplication of equipment, but we will not make it mandatory.

²⁰ Although some commenters, most notably ARA, argue that a "general electronics technician" is needed aboard ocean-going vessels for the joint purpose of maintaining radio and navigational equipment, we conclude that the three maintenance options provided by the IMO satisfactorily address radiocommunication requirements. Whether ships need additional personnel for the maintenance of non-radiocommunications equipment, such as navigational equipment, is not at issue here. Maintenance of electronic equipment, other than radiocommunication equipment, is a matter under the jurisdiction of the Coast Guard.

²¹ We note that ships that carry radiotelegraphy equipment (*i.e.*, passenger ships of twelve persons or more and cargo ships of 1600 tons gross tonnage and over) must continue to carry radio officers in accordance with the Communications Act. Until the Communications Act is amended, this requirement remains in force. The designated GMDSS radio operator for emergency communications may be the radio officer or a different person who has a GMDSS license issued by the Commission.

whether they must take the GMDSS examination. We further requested comments on whether a certificate should be required for the at-sea maintainer, what standards should be enacted, and who should issue the certificate. See *Notice* at paras. 40-41.

21. *Radio operators:* All commenters agree with our proposal to test and license radio operators on board GMDSS ships. RTCM and the Coast Guard recommend, however, that the MP be deleted from the list of licenses allowed a GMDSS endorsement. Comments of RTCM at 27, Coast Guard at 6. The National Maritime Electronics Association (NMEA), AIMS, and Reno also support this position. In their opinion, the MP license is not adequate to ensure the skill level required for GMDSS operations. Comments of AIMS at 3, Reno at 14. In response to these concerns, we are adopting a separate GMDSS license, called the GMDSS Radio Operator's License, instead of a GMDSS endorsement. This will provide the desired separation between the GMDSS radio operators and maintainers, as discussed earlier.²² As proposed in the *Notice*, the GMDSS radio operator requirements will be based on "the international General Radio Operator's Certificate, as specified in Article 55 of the ITU Radio Regulations."²³ The qualifications for this certificate were adopted by the ITU and the IMO after extensive review by the international community. They include requirements such as knowledge of basic operational practices, emergency procedures, duplication principles, watch requirements, and antenna adjustments. Thus, we find that the GMDSS Radio Operator's License ensures that the GMDSS radio operator is qualified for GMDSS distress and safety radiocommunications, including performing certain equipment adjustments.

22. The comments on grandfathering varied. NMEA and AIMS state that T-1 and T-2 operators should not be grandfathered. NMEA at 2 and AIMS at 3-4. Russell suggests that persons holding T-1 and T-2 certificates with six month endorsements, or G licenses and six months experience, be issued the GMDSS endorsement when the steamship company advises us in writing that the person has demonstrated the ability to maintain GMDSS, radar, and navigation equipment at sea. Under our current rules, radio operator licenses are valid for five years and are renewable without further examination. 47 C.F.R. § 13.28. Consequently, if we were to grandfather existing radio operators, they could operate indefinitely without demonstrating their knowledge of GMDSS procedures.²⁴ We conclude, therefore, that to ensure safety aboard GMDSS ships, grandfathering of existing radio operators

is not appropriate. GMDSS radio operators must be thoroughly familiar with the newly adopted GMDSS requirements to ensure safety. Thus, all persons wishing to become GMDSS radio operators will have to take a new examination for the GMDSS Radio Operator's License.²⁵

23. *At-sea maintainers:* All commenters support licensing of the at-sea radio maintainer. All urge us to establish comprehensive standards to ensure the safety of life, property, and the environment. ARA urges that we "set standards at a level that guarantees that the newly-licensed RO/REO can effectively maintain and repair electronic equipment to the component level." ARA comments at 25. The Coast Guard and RTCM state that the at-sea maintainer could be certified using criteria developed by the IMO. RTCM comments at 45. NMEA suggests that we establish an advisory panel, composed of representatives from training institutions, to produce a unified test and standard for both on-shore and at-sea maintainers. NMEA comments at 3. AIMS states that we could recognize authorized programs run by companies, unions, or private schools. AIMS comments at 3-4. Lundeberg states that NMEA should be considered as a neutral party to administer the maintainer designation. Lundeberg comments at 5.

24. We agree that the at-sea radio maintainer should be licensed. (This would be a separate license from the radio operator license.) Ships using at-sea maintenance, and only those ships choosing at-sea maintenance, will be required to carry a licensed GMDSS radio maintainer. The T-1, T-2, and G licenses will suffice for the GMDSS radio maintainer because their examinations currently include knowledge of technical matters applicable to adjustments and repair of radio equipment generally (see 47 C.F.R. § 80.167). As suggested by many comments, however, we believe an outside entity or entities could administer the program and possibly issue the license for the at-sea GMDSS radio maintainer. Consequently, we encourage the industry to form a committee to review the qualifications for the at-sea GMDSS radio maintainer and examine the licensing procedures for this maintainer. To be effective, the industry should focus on radio equipment particular to the GMDSS and matters related to radio maintenance at sea.²⁶ Until further recommendations are made, we will recognize the existing T-1, T-2, or G licenses for the at-sea GMDSS radio maintainer (see Appendix E, § 80.1074).

25. For these reasons, we are requiring that a GMDSS ship carry two radio operators (a primary and a backup) each holding GMDSS Radio Operator's Licenses and, if

²² If we exclude the MP license as suggested by commenters, GMDSS ships would have to carry radio operators holding GMDSS-endorsed T-1, T-2, or G licenses, which also qualifies them to repair the radio equipment (see 47 C.F.R. § 80.167). This is not acceptable because, as concluded earlier, we wish to separate the requirements for radio operators and maintainers on-board GMDSS ships. Therefore, we will adopt a new license for GMDSS radio operators rather than adding an endorsement to existing licenses.

²³ See Radio Regulations, Article 55, and IMO Assembly Resolution on Training for Radio Personnel (GMDSS).

²⁴ Our concern is that the radio operators know the GMDSS procedural requirements for distress and safety situations. We expect that most radio officers and operators already know how

to operate the GMDSS equipment technically because it is simple to use and many ships already carry much of the GMDSS-required equipment voluntarily.

²⁵ We note that this requirement is for compulsory ships. AIMS, NMEA, and Lundeberg argued that voluntarily-equipped GMDSS ships also have properly trained radio operators. See comments of AIMS at 2, NMEA at 3, and Lundeberg at 4. We agree, and we will revise our MP examination to include GMDSS-related questions prior to February 1, 1995, the effective date of the GMDSS rules for new ships. Similarly, we will revise the requirements for the Restricted Radio Operator's Permit (RP) to reflect GMDSS operations prior to February 1, 1995.

²⁶ See IMO Assembly Resolution on Training for Radio Personnel (GMDSS), Annex 5.

the at-sea maintenance option is used, one GMDSS radio maintainer holding a T-1, T-2, or G license.²⁷ The GMDSS radio operator can be the radio officer required by the Communications Act or any other licensed member of the crew. The GMDSS radio maintainer can be any crew member licensed by the Commission for that purpose. The GMDSS radio maintainer may be one of the GMDSS radio operators or a different person. Further rule amendments regarding the at-sea GMDSS radio maintainer will be considered later, upon recommendations from an industry group. In our view, this approach fits with the international requirement to provide flexibility for radio-equipment maintenance while ensuring that every ship carries personnel qualified for distress and safety radiocommunications purposes.

C. Operational and Technical Issues

(1) Maritime safety information (MSI)

26. *NAVTEX*: To ensure receipt of MSI broadcasts, such as weather warnings and emergency messages, via the NAVTEX system, we expanded on IMO provisions and proposed that *all* U.S. compulsory ships carry a NAVTEX receiver. We indicated in the *Notice* that IMO requires a NAVTEX receiver *only if* the ship sails in NAVTEX service areas. We explained that we were proposing a more stringent standard than IMO, noting that most U.S. vessels would sail in NAVTEX areas because the Coast Guard has established extensive NAVTEX service areas along the United States coastline. *Notice* at para. 28. MC opposes this requirement and argues that there are significant gaps in NAVTEX coverage. RTCM acknowledges that there are gaps in NAVTEX coverage, such as the entrance to New York Harbor, but does not oppose the proposal. RTCM comments at 4. MC also claims that there are other existing maritime information systems that are superior to NAVTEX, such as the Defense Mapping Agency Hydrographic/Topographic Center's "Automated Notice to Mariners System" (ANMS). MC suggests that we should eliminate the NAVTEX requirement or at minimum make it optional. MC comments at 63. We disagree with MC concerning the utility of the NAVTEX system. The NAVTEX system is an established system that will be expanded under the GMDSS to provide the primary means of disseminating maritime safety information. There are other warning systems available, but they do not serve the same purpose as the NAVTEX system. We believe that a clear requirement for U.S. vessels to carry NAVTEX receivers would be beneficial even if it is more stringent than IMO's requirement. We prefer to treat the rare case where a ship never sails into a NAVTEX service area on a case-by-case basis rather than making NAVTEX receivers optional. Therefore, we conclude that GMDSS ships in the United States must carry a NAVTEX receiver as of August 1, 1991, as proposed.²⁸

27. *INMARSAT Enhanced Group Calling (EGC)*: We also proposed that most GMDSS ships, which sail outside NAVTEX coverage areas but within the INMARSAT coverage area, carry equipment capable of receiving maritime safety information from the EGC feature of the INMARSAT system. *Notice* § 80.1085(a)(5). RTCM and the Communications Satellite Corporation (COMSAT) note that there are three group calling systems available through INMARSAT and suggest that the rules specify the EGC "SafetyNET" system.²⁹ RTCM comments at 4. We have made this change noting that the SafetyNET system is required for GMDSS ships by IMO. RTCM further proposes that we require GMDSS ships to carry *dedicated* INMARSAT EGC receivers separate from the ship earth stations, as unscheduled emergency broadcasts or distress alert relays could be missed if the ship earth station is being used for other communications at the time the maritime safety information is transmitted. RTCM comments at 6. The need for a dedicated INMARSAT EGC receiver was discussed extensively by the international community. The IMO decided that this would be an unnecessary burden because urgent messages could be sent directly to the appropriate ships as call announcements. The INMARSAT system has established procedures to assure receipt of call announcements during times when the ship earth station is busy, such as holding call announcements in a queue for when the ship's satellite earth station is not in use. See INMARSAT-C System Definition Manual, Release 1.3. 1. (1991). Thus, emergency MSI broadcasts could be sent directly if the emergency warranted then be added to the next scheduled broadcast. The GMDSS watch requirements require that ships maintain a radio watch for scheduled MSI broadcasts appropriate to its sea area. See Appendix E, § 80.1123(b). We therefore see no need to require U.S. ships to carry a dedicated INMARSAT EGC receiver, which exceeds the IMO provisions.³⁰

(2) Equipment standards and authorization

28. *Performance standards*: Russell and MC comment that the GMDSS equipment requirements should contain specifications for reliable operation under the types of environmental conditions likely to be encountered at sea. MC comments at 28. This concern is unfounded because the IMO and CCIR standards adopted today address this point. See Appendix E, § 80.1101(a). Included in these standards is a "General Standard for all Shipboard Radio Equipment" that requires GMDSS equipment to be capable of continuous operation under the various conditions of vibration, humidity and temperature likely to be experienced on ships (see IMO COM 36/21, Annex 12).

29. In the *Notice*, we proposed that all GMDSS equipment be type accepted by the Commission except equipment used in the INMARSAT system (e.g., INMARSAT-A ship earth stations), which must be notified by the Com-

²⁷ We note that the six month service endorsement listed in 47 C.F.R. § 13.2(c) is not required.

²⁸ We further note that, although MC stated that there are no mandatory monitoring or watchkeeping requirements, the rules proposed and adopted today require a radio watch for NAVTEX MSI broadcasts. See Appendix E, § 80.1123.

²⁹ The three systems are: the INMARSAT-A group call system;

the EGC "FleetNET" system; and the EGC "SafetyNET" system. The EGC "SafetyNET" system has been identified by IMO to provide maritime safety information for the GMDSS.

³⁰ We note that ships equipped with INMARSAT-A terminals do not include the EGC feature, however, and they will have to add either INMARSAT-C systems or separate EGC receivers to receive the SafetyNET broadcasts.

mission for use in the GMDSS system.³¹ *Notice* at para. 31. All comments supported our type acceptance proposal. Regarding notification of INMARSAT equipment, however, RTCM suggests that we adopt two procedures for INMARSAT equipment: (1) notification for equipment that is approved by INMARSAT "specifically for the GMDSS" including all peripheral equipment, such as processors and printers; and (2) type acceptance for any equipment that is not approved by INMARSAT "specifically for GMDSS" and our acceptance be granted only for the specific equipment and peripheral configurations represented in the application. We have reviewed this matter and do not find it necessary to adopt two procedures for INMARSAT equipment. In our view, two procedures (*i.e.*, notification and type acceptance for the same piece of INMARSAT equipment) would be confusing for the Commission, manufacturers, and ship owners. When INMARSAT approves equipment it issues certificates, called Type Approval Particulars (TAP), for the equipment and any peripherals essential for its operation. Thus, INMARSAT's approval provides the information necessary to determine if the equipment meets GMDSS specifications and what peripherals are essential. We therefore will require INMARSAT equipment to be approved by INMARSAT then notified by the Commission. Manufacturers should submit the INMARSAT TAP certificates to the Commission and certify that its equipment, including peripherals, meet the IMO and CCIR performance standards for GMDSS equipment. This should satisfy RTCM's concern that all INMARSAT equipment including peripherals meet GMDSS requirements.

30. After consideration of these comments, we are adopting the type acceptance and notification procedures as proposed. All GMDSS equipment must be type accepted by the Commission except equipment used in the INMARSAT system, which must be notified by the Commission for use in the GMDSS system. The IMO and CCIR standards are incorporated by reference. GMDSS equipment other than INMARSAT equipment will be type accepted based on the representations and test data submitted by the applicant. For INMARSAT equipment, applicants must attest that the equipment meets the IMO and CCIR performance standards and include a copy of the INMARSAT TAP certificate with the notification application. Finally, as proposed, GMDSS equipment need not be submitted unless specifically requested by the Commission.³²

³¹ Type acceptance and notification are procedures by which we issue equipment authorizations. See 47 C.F.R. § 2.901. For type acceptance, the applicant makes measurements and submits certain representations and test data that demonstrate compliance with the technical standards. For notification, the applicant makes measurements and attests that the measurements demonstrate compliance with the technical standards. For notification, test data are not submitted unless specifically requested by the Commission. For both type acceptance and notification, an identification number (FCC ID#) is issued by the Commission.

³² In the *Notice*, we proposed that GMDSS equipment be exempt from the current rule that applicants for type acceptance of compulsory equipment submit a working unit. *Notice* at para. 31, 47 C.F.R. § 80.203(c). We received no comments concerning this point.

³³ The label does not denote authorization. The only way to verify that the equipment meets GMDSS performance standards is for interested parties to check that the FCC ID# on the

31. *Equipment labeling*: RTCM recommends that we incorporate in the rules specific labeling requirements for GMDSS equipment so that the public can easily identify equipment authorized for GMDSS use. RTCM claims that there are many models of equipment on the market that may provide capabilities similar to GMDSS requirements but that may not meet the GMDSS standards. Labeling would identify the equipment that meets GMDSS standards. See RTCM comments at 22-23. We agree that labeling of GMDSS approved equipment would be helpful to the public. Therefore, we are incorporating a labeling requirement for type accepted and notified GMDSS equipment.³³

(3) INMARSAT ship earth stations

32. Several commenters note limitations of INMARSAT ship earth stations, including blocking of the line-of-sight path from the antenna to the satellite by ship structures and the potential inability of the antenna to operate if a ship is listing. Reno states that if a ship has lost its power or steering (an emergency situation), it cannot change course to correct blocking of the antenna. Reno comments at 3. The Coast Guard agrees that vessel listing could make an INMARSAT ship earth station inoperable in an emergency. It proposes that our inspection of shipboard emergency communications equipment include the location of INMARSAT antennas to ensure that masking is minimized. Coast Guard comments at 3. We recognize that listing of a ship could render an INMARSAT-A ship earth station inoperable. The GMDSS, however, provides alternate means of distress alerting by DSC or EPIRB. An inoperable ship earth station would hinder distress communications, but would not render distress alerting impossible. To minimize masking, we are including antenna siting as suggested by the Coast Guard as part of the ship inspection. The IMO Performance Standards provide guidelines for proper antenna siting to avoid masking.³⁴

33. Lundeborg notes that some INMARSAT ship earth stations already in use on board ships may not meet the GMDSS standards and opposes the use of these terminals by ships after implementation of the GMDSS. We emphasize that INMARSAT equipment, like other GMDSS equipment, must be authorized by the Commission specifically for GMDSS use. Consequently, existing INMARSAT ship earth stations are not acceptable unless notification is granted by the Commission and a FCC

equipment is included in the latest FCC Radio Equipment List and that it is identified on the list as authorized for GMDSS use. Information on type acceptance and notification of GMDSS equipment can be accessed through the FCC's Office of Engineering and Technology's Public Access Link (PAL) system, 24 hours a day, seven days a week, on (301) 725-1072. For convenience, we will also publish an additional equipment list of GMDSS authorized equipment after sufficient equipment has been authorized for GMDSS use. When published, copies of this list can be obtained from the Commission's duplicating contractor. Prior to publication of this list (or for the latest authorizations), information on GMDSS equipment is available only through the PAL system.

³⁴ See IMO Resolutions A.608(15) and A.663(16), which have been incorporated by reference into the Rules for antenna siting of INMARSAT-A and INMARSAT-C ship earth stations.

ID# is issued. For existing INMARSAT equipment that meets the GMDSS standards but does not have the requisite FCC ID# and GMDSS label attached, the manufacturer's application for notification may indicate that the FCC ID# and GMDSS label will be attached "in the field" by the manufacturer's representatives. (The manufacturer's statement is in addition to the INMARSAT approval certificate and affidavit that the equipment meets GMDSS standards.) After authorization is granted, the manufacturer must add the FCC ID# and GMDSS labels to existing equipment. The actual placement of these labels must be done by the manufacturer or a manufacturer authorized representative. All equipment used by GMDSS ships to fulfill GMDSS requirements, including INMARSAT ship earth stations, must have appropriate FCC ID# and GMDSS labels and appear on the FCC Radio Equipment List with a notation that it is authorized for GMDSS use.

(4) Other satellite systems

34. The *Notice* referred to INMARSAT as the primary satellite system used for GMDSS communications.³⁵ The American Mobile Satellite Corporation (AMSC) notes that other satellite systems may obtain IMO approval, and suggests that language in the proposed rules which refers to INMARSAT be modified to refer to both INMARSAT and any other IMO approved satellite system. The rules, however, are written with the intent of enacting IMO regulations regarding the GMDSS. Referring to other IMO approved satellite systems implies that there are other IMO authorized systems. Currently there are not. Should another satellite system receive IMO approval, we will consider adding that system to the rules.

(5) Terrestrial Digital Selective Calling (DSC)

35. RTCM recommends that we adopt several additional requirements for DSC receivers: a dedicated, non-scanning receiver for monitoring VHF DSC Channel 70; a scanning receiver for monitoring MF and HF DSC channels, limited to DSC channels; and position updating in DSC equipment every four hours. RTCM comments at 31-32. Russell recommends that we permit scanning of six or more HF DSC channels. Russell comments at 4. In response to these recommendations, we will amend § 80.1085(a)(2) of the rules to require monitoring of VHF DSC Channel 70 with a dedicated, non-scanning receiver. VHF Channel 70 will become an important safety calling channel under the GMDSS and we agree that a dedicated receiver is reasonable. We will also amend the watchkeeping requirements in § 80.1123(a)(3) to permit scanning of up to six MF/HF DSC distress and safety channels. The International Radio Consultative Committee (CCIR) indicates that a single receiver should scan no more than six channels. See CCIR Report 908-1. Finally, we will require updating of the ship's position at least every four hours either manually or automatically through a navigation receiver.³⁶ This information can be

easily entered into the DSC equipment and periodic updating will provide an approximate ship's position if an emergency prohibits entry at the time of distress.

(6) Survival craft radios, EPIRBs, and SARTs

36. The Coast Guard proposes that it, rather than the Commission, should be the governing agency for carriage requirements for survival craft two-way portable radios, EPIRBs, and SARTs. Coast Guard comments at 6. RTCM and NMEA support this position and claim that two sets of rules, the Coast Guard's and the Commission's, will make for an awkward and inconsistent regulatory structure. We disagree with the commenters on this matter. In the case of the GMDSS provisions, the requirements cannot easily be divided between ship and survival craft requirements. The two-way portable radios are part of the survival craft requirements, the EPIRBs are ship requirements, and the SARTs are both survival craft and ship requirements. Thus, we believe that it will make the GMDSS carriage requirements easier to understand and follow if all GMDSS requirements can be found in one set of federal regulations, *i.e.*, the Commission's Rules. Moreover, the Communications Act, 47 U.S.C. § 357, requires the Commission to ensure that survival craft radio equipment is carried in accordance with international treaties. Thus, we have a statutory responsibility to address these requirements.

37. In the *Notice*, we proposed that all compulsory ships be required to carry EPIRBs by August 1, 1993. As permitted by IMO, we proposed that the requisite EPIRB be the 406 MHz EPIRB, 1.6 GHz EPIRB, or VHF Channel 70 EPIRB.³⁷ We noted in the *Notice* that at present only the 406 MHz EPIRB is operational. The 1.6 GHz EPIRB is in pre-operational testing and the VHF Channel 70 EPIRB has not been developed. We stated that we proposed all three EPIRBs regardless of their development so that our rules would provide for all options permitted by IMO. This would have allowed all three EPIRBs to be used once they became operational without the delay entailed by further rule making.

38. The Coast Guard, RTCM, and several others suggested that we postpone the use of the 1.6 GHz and VHF Channel 70 EPIRBs for U.S. vessels to a later date. RTCM recommends that equipment standards and shore facilities should be reviewed before we permit the use of these EPIRBs in the United States. RTCM comments at 16. Because of the critical function of the EPIRBs for alerting, we agree that a thorough review of the equipment standards and shore facilities would be beneficial prior to any action permitting the use of these EPIRBs in the United States. Thus, we have deleted the optional use of 1.6 GHz and VHF Channel 70 EPIRBs from the rules pending further review. Although we are not authorizing the use of the 1.6 GHz and VHF Channel 70 EPIRBs at this time, we continue to support their use in the GMDSS.

³⁵ The COSPAS-SARSAT satellite system is used for alerting and locating only.

³⁶ As noted by Lundeburg and RTCM, the required DSC equipment would not automatically include the nature of the

distress and the time and position of the ship transmitting the call. Automatic transmission of this information is possible, however, if additional non-mandatory equipment is added.

³⁷ The 406 MHz EPIRB uses the COSPAS-SARSAT satellite system and the 1.6 GHz EPIRB uses the INMARSAT satellite system.

39. Regarding 406 MHz EPIRBs, the Coast Guard, RTCM, and Lundeberg, recommend that 406 MHz EPIRBs used on U.S. vessels be required to meet our present regulations in addition to IMO and CCIR requirements. Comments of RTCM at 41, Coast Guard at 8, and Lundeberg at 3. Our present regulations require that 406 MHz EPIRBs contain homing beacons operating on 121.5 MHz as an integral part of the equipment. 47 C.F.R. § 80.1061. The IMO and CCIR requirements for the 406 MHz EPIRB do not include a 121.5 MHz homing capability. In the *Notice*, we proposed that all GMDSS equipment including 406 MHz EPIRBs meet only the IMO Performance Standards and the CCIR Recommendations rather than our current rules. *Notice* § 80.1101. Thus, our proposal did not include the additional standards for 406 MHz EPIRBs currently prescribed in our rules. Upon review, we agree with the commenters that the present rules incorporate a number of beneficial requirements, such as the 121.5 MHz homing beacon, strobe lights, and test procedures to ensure equipment reliability.³⁸ Therefore, the GMDSS requirements for 406 MHz EPIRBs refer to the IMO and CCIR standards as well as the current regulations in 47 C.F.R. § 80.1061.³⁹

40. In accordance with GMDSS provisions, we proposed that every ship subject to the GMDSS carriage requirements carry a 9 GHz radar transponder (SART). Lundeberg and RTCM recommend that in addition to the SART, a 121.5 MHz homing transmitter capability be required for all U.S. vessels. Lundeberg comments at 3, RTCM comments at 18. MC also proposes that the Commission require 121.5 MHz and 243.0 MHz transceivers for survival craft to allow bi-directional communications between survival craft and aircraft. MC reply comments at 4. Because we are requiring all GMDSS ships to equip with 406 MHz EPIRBs which include 121.5 MHz homing beacons, there is no need for a separate 121.5 MHz homing transmitter. While we understand the desirability of having bidirectional communications on 121.5 MHz and 243 MHz as an aid in aircraft rescue operations, this exceeds the IMO provisions and we are not convinced that it is necessary at this time. The 406 EPIRBs can be programmed with location information to aid in search and rescue efforts. Thus, we will associate consideration of any further 121.5/243.0 MHz requirements with any future review of the 1.6 GHz and VHF Channel 70 EPIRBs discussed above.

(7) Reserve power and antenna tracking requirements

41. We received comments concerning requirements for reserve power for distress communications, and for maintaining antenna tracking system input in emergency situations. Torgerson states that the one hour requirement for reserve power is not enough and notes that the present

requirement for reserve power is six hours. He claims that a realistic reserve power requirement would be 12 hours. MC has similar concerns about the reserve power supply. Additionally, MC is troubled about insuring adequate power to the INMARSAT ship earth stations. It suggests that external sources of power for INMARSAT terminals should be based on a method to ensure that terminals have adequate auxiliary power supply filtering to protect the terminal's computer circuits from the effects of unfiltered DC square wave components in the power supply source voltage. Russell recommends that communications satellite equipment be capable of being operated from battery power and that the equipment not rely on electrical inputs from the ship's GYRO compass because these signals may not exist in emergencies. In reply, the Coast Guard recommends that our inspection of vessels include ensuring that gyro information necessary to maintain satellite tracking be maintained in an emergency, *e.g.*, during loss of ship's power. See comments of Torgerson at 4, MC at 28, and Russell at 3, and Coast Guard reply comments at 3.

42. In the *Notice*, we proposed that all ships have reserve sources of energy to supply power for distress and safety communications for one hour. In the event of failure of the ship's main power source, this one hour of reserve power is intended to be used after the exhaustion of the emergency sources of electrical power. The emergency power requirement for ships constructed after February 1, 1995, is 18 hours for cargo ships of 500 tons gross tonnage and 36 hours for passenger ships irrespective of size. See SOLAS Convention, Chapter II-1, Regulations 42, 43. We have reviewed this issue and are adding a further requirement, in accordance with the GMDSS provisions, for six hours of reserve power for ships that do not meet the 18 and 36 hour emergency power requirements. See, 1988 Amendments, Chapter IV, Regulation 13. This change along with the emergency power requirements should provide satisfactory backup power for emergency situations. Regarding MC's comment concerning auxiliary power supply filtering, the equipment standards for ship earth stations require that any change in power supply or momentary interruption of electrical energy should not render the INMARSAT terminal "inoperative or require the equipment to be re-initialized." IMO Resolution A. 608(15), Annex 5. This requirement also states that it should "be possible to operate the ship earth station and all equipment necessary for its normal functioning, including the antenna tracking system, from an alternative source of energy." Further our ship inspections for GMDSS ships will include checking that tracking information can be maintained during a

³⁸ Our present rules require that 406 MHz EPIRBs meet the technical and performance standards contained in the RTCM document titled "RTCM Recommended Standards for 406 MHz Satellite Emergency Position-Indicating Radiobeacons (EPIRBs)" dated July 31, 1987. 47 C.F.R. § 80.1061(a).

³⁹ For 406 MHz EPIRBs to be used on GMDSS ships they must meet the GMDSS IMO/CCIR standards in addition to the present requirements for 406 MHz EPIRBs. We believe most existing 406 MHz EPIRBs do meet these GMDSS IMO/CCIR standards already. Consequently, rather than requiring existing 406 MHz EPIRBs to be type accepted again, we will allow the manufacturers to submit letters to the FCC's testing laboratory

verifying that "unit, FCC ID #, meets the IMO Performance Standards and CCIR Recommendations for 406 MHz EPIRBs applicable to GMDSS as specified in 47 C.F.R. § 80.1101." We can then add the FCC ID# for these 406 MHz EPIRBs to the GMDSS approved equipment list. If desired, the manufacturer, or a manufacturer's authorized distributor, also may add the requisite GMDSS label. (See previous discussion concerning equipment labeling for existing equipment, at para. 31.) Regardless of whether the 406 MHz EPIRBs have GMDSS labels or not, they can be identified by checking the Commission's Equipment List for their FCC ID# and a note indicating acceptance for GMDSS use.

loss of the ship's main power. Therefore, a specific requirement concerning auxiliary power supply filtering is unnecessary.

(8) Watchkeeping requirements

43. In the *Notice*, we proposed that GMDSS ships maintain watches by DSC on the frequencies appropriate to its sea area, by satellite if equipped with a ship earth station and, until February 1, 1999, by radiotelephony on the existing distress frequencies 2182 kHz and 156.8 MHz (VHF Channel 16). *Notice* § 80.1123. Russell states that the communications link between GMDSS ships and small vessels will be lost after February 1, 1999, if we eliminate the radiotelephony watch requirement on 2182 kHz and VHF Channel 16. He argues that the absence of this requirement after February 1, 1999, will make it difficult for two passing vessels to communicate, and that small non-GMDSS ships with only short range VHF may be unable to contact a shore station with distress messages. He states that if GMDSS ships continue a watch on VHF Channel 16 or 2182 kHz, they may be able to receive the smaller ships' distress calls and come to their rescue. Russell comments at 2. Additionally, Russell, Torgerson, and Lundeborg note that 2182 kHz is relatively ineffective in tropical latitudes. Lundeborg suggests watchkeeping requirements on the 6 MHz or 8 MHz bands to supplement the 2182 kHz watch. Comments of Russell at 4, Torgerson at 2, and Lundeborg at 2. The Coast Guard, in its reply comments, encourages small craft to fit with DSC equipment and acknowledges that an extension of radiotelephony watchkeeping requirements may be necessary if DSC is not in common use by 1999. Coast Guard reply comments at 4.

44. Our proposal to eliminate the ship watch on 2182 kHz and VHF Channel 16 is in agreement with the international GMDSS provisions and anticipates a shift by all vessels to the DSC frequencies by 1999. Thus, ships equipped with DSC radios will be able to use DSC frequencies in lieu of 2182 kHz or VHF Channel 16 to communicate when passing and for distress communications. Because DSC calling is "direct dialing" for ships, it is an improvement over the current general calling on 2182 kHz and VHF Channel 16. We will follow the international provisions by adopting the 1999 deadline. Further, reliance on 2182 kHz will diminish after August 1, 1993, because all GMDSS ships are required to be equipped with a 406 MHz EPIRB for distress alerting by that date. Additionally, although the comments are correct that the effectiveness of 2182 kHz may be limited in the tropical regions, we decline to impose an additional watch requirement on the 6 MHz and 8 MHz bands, as this would entail additional equipment requirements and be a significant watchkeeping burden. For these reasons, we are reluctant to expand watchkeeping requirements from those imposed by international requirement. Thus, we are adopting the watchkeeping requirements as proposed. We will monitor the implementation of DSC equipment in small vessels and will review radiotelephony watch requirements if necessary.⁴⁰

(9) Funding and charges for GMDSS communications

45. We proposed a requirement in the *Notice* that distress communications be carried free of charge. All commenters who addressed this point recommend that GMDSS communications should be governed by the provisions of the Communications Act and the joint decision of IMO and INMARSAT. See 47 U.S.C. § 357 and "Report and Recommendations of the Joint IMO/INMARSAT Meeting on Funding of Maritime Distress and Safety Communications" (FDSC 1/13). We agree and have incorporated these charging provisions into the rules. In the ship-to-shore direction no charges will be levied for distress alerts, search and rescue coordination communications, urgent navigational and meteorological danger reports, or medical assistance messages where a grave and imminent danger to life exists. Standard meteorological reports, ship reports and medical advice where a grave danger to life is not present may be charged to the addressees of the messages. FDSC 1/13, Annex 6 (1990). In the shore-to-ship direction, no charges will be levied for distress alerts, SAR coordination communications, or medical assistance messages relating to an imminent danger to life. The originators may be charged for meteorological forecasts, meteorological warnings, navigational warnings, routine medical advice, and other urgent messages.

IV. CONCLUSION

46. By these amendments, U.S. vessels will be brought into conformity with GMDSS provisions. As noted above, the GMDSS provisions are mandated by the SOLAS Convention, to which the United States is signatory. We find that the GMDSS offers significant advantages for marine safety that should not be delayed. Indeed, there are valid reasons, such as worldwide alerting, coordinated search and rescue operations, and dissemination of maritime safety information, to encourage implementation of the GMDSS as soon as possible. Rapid progress toward full implementation of the GMDSS is in the public interest. We will proceed with equipment authorization and licensing of GMDSS radio operators as quickly as possible. Until the Communications Act is amended, however, the rules adopted today must be viewed as an extension to the current safety system requirements. Consequently, U.S. compulsory ships that comply with the GMDSS provisions, which become mandatory in 1995 for new ships and in 1999 for existing ships, will be required to carry authorized GMDSS equipment and qualified GMDSS personnel plus existing radiotelegraph equipment and radio officers, as appropriate. We must emphasize that the current radiotelegraphy and radio officer requirements are *not* part of the GMDSS requirements adopted today. At the same time, we do not adopt any rule changes today that relieve compulsory ships from the requirements specified in the Communications Act.

⁴⁰ Additionally, we note that protection afforded distress and safety frequencies under 47 C.F.R. § 15.205 will be expanded to cover GMDSS frequencies.

V. PROCEDURAL MATTERS & ORDERING CLAUSES

47. In accordance with Section 605(b) of the Regulatory Flexibility Act of 1980, 5 U.S.C. § 605(b), our final analysis of the economic impact of these amendments to small entities is set forth in Appendix D.

48. Accordingly, IT IS ORDERED that, pursuant to the authority contained in Sections 4(i) and 303(r)

of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i) and 303(r), Parts 13 and 80 of the Commission's Rules ARE AMENDED as set forth in the attached Appendix E, effective [30 days after FR publication].

49. IT IS FURTHER ORDERED that a copy of this *Report and Order* will be sent to the Chief Counsel for Advocacy of the Small Business Administration.

50. IT IS FURTHER ORDERED that this proceeding IS TERMINATED.

51. For further information, contact Sean White, Room 5114, Private Radio Bureau, Federal Communications Commission, 1919 M Street N.W., Washington, D.C. 20544; telephone 202-632-7175.

FEDERAL COMMUNICATIONS COMMISSION

Donna R. Searcy
Secretary

APPENDIX A**LIST OF COMMENTERS****COMMENTS**

1. Theodore K. Phelps (Phelps)
2. Benjamin J. Russell (Russell)
3. C.E. Spencer (Spencer)
4. Michael V. Zbrozek (Zbrozek)
5. Carl Torgerson (Torgerson)
6. Raytheon Marine Company (Raytheon)
7. Mark W. Reno (Reno)
8. Norman Osborne (Osborne)
9. Richard E. Dixon (Dixon)
10. Marine Communications, Inc. (MC)
11. Radio Technical Commission for Maritime Services (RTCM)
12. United States Coast Guard (Coast Guard)
13. National Marine Electronics Association (NMEA)
14. Dr. Michael C. Trahos (Trahos)
15. American Mobile Satellite Corporation (AMSC)
16. American Maritime Officers Service (AMOS)
17. District 2, Marine Engineers Beneficial Association- Associated Maritime Officers (District 2)

18. American Institute of Merchant Shipping (AIMS)

19. Communications Satellite Corporation (COMSAT)

20. The American Radio Association (ARA)

21. Seafarers Harry Lundeberg School of Seamanship (Lundeberg)

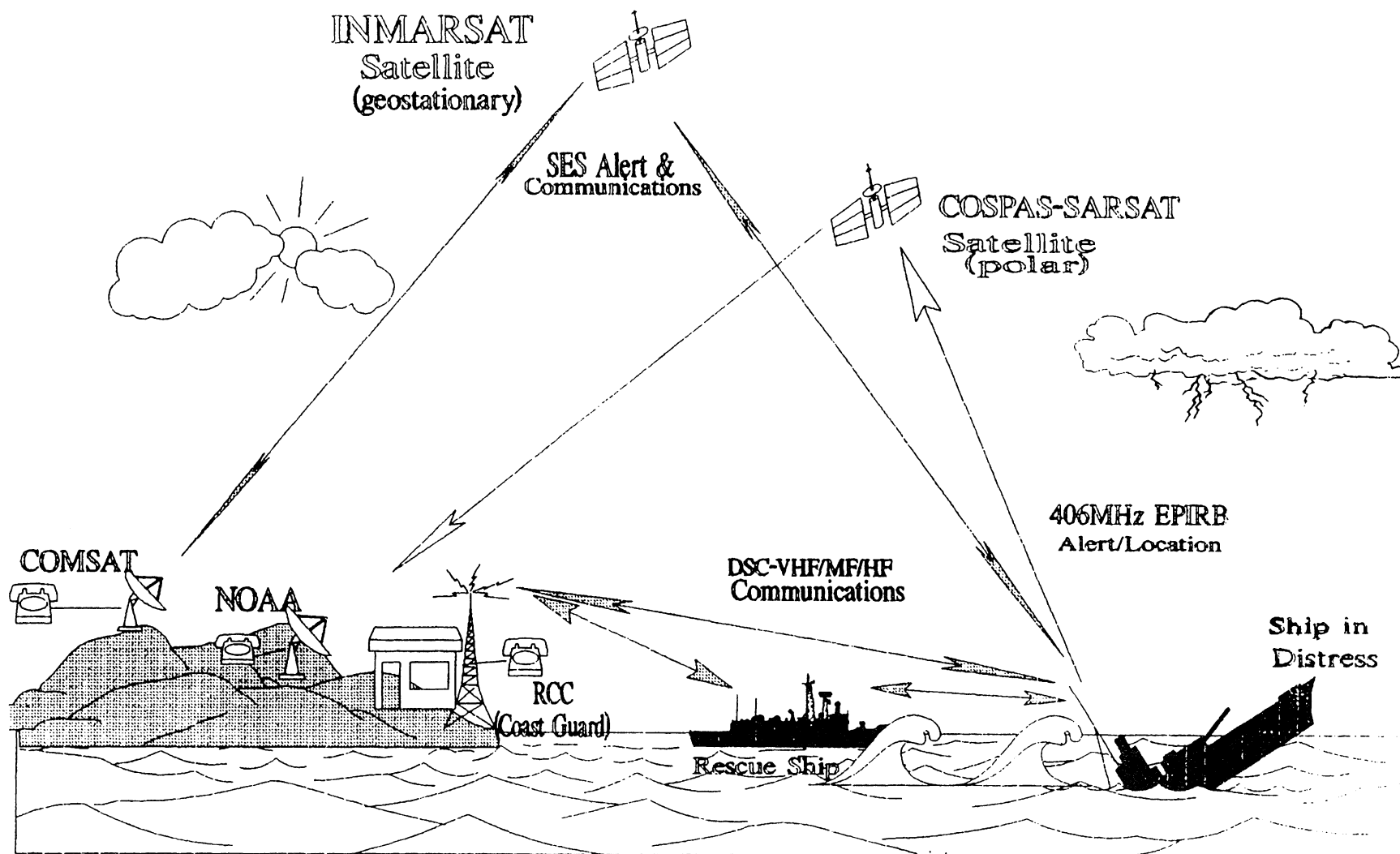
22. Energy Transportation Corporation (ETC)

REPLY COMMENTS

1. Marine Communications, Inc. (MC)
2. United States Coast Guard (Coast Guard)
3. American Institute of Merchant Shipping (AIMS)
4. The American Radio Association (ARA)
5. Communications Satellite Corporation (COMSAT)
6. Exxon Communications Company (Exxon)
7. National Marine Electronics Association (NMEA)

EX PARTE COMMENTS

1. National Wildlife Federation (NWF)
2. The American Radio Association (ARA)



An Example of GMDSS Communications

Appendix B

APPENDIX C

GMDSS IMPLEMENTATION DATES

The GMDSS regulations apply to cargo ships of 300 tons gross tonnage and over when traveling on international voyages or in the open sea, and to ships carrying twelve passengers or more irrespective of size when traveling on international voyages or in the open sea. These ships are termed "compulsory ships." The following is a summary of the implementation dates for the GMDSS.

February 1, 1992 GMDSS provisions of SOLAS Convention enter into force. U.S. ships begin voluntary fitting of GMDSS equipment. Until Communications Act is amended, carriage of current distress and safety system remains mandatory. (47 C.F.R. § 80.1065(b)(5)).

February 1, 1992 New passenger ships and cargo ships of 500 tons gross tonnage and over constructed on or after this date must carry at least two radar transponders (one on each side of ship) and at least three two-way VHF radiotelephones for use in survival craft. New cargo ships of 300-500 tons gross tonnage must carry at least one radar transponder and at least two two-way VHF telephones. (47 C.F.R. § 80.1095).

August 1, 1993 All compulsory ships are required to carry a NAVTEX receiver and a 406 MHz EPIRB. * Ships will no longer be required to carry a Class S EPIRB for survival crafts after equipping with the 406 MHz EPIRB. (47 C.F.R. § 80.1065(b)(1) and SOLAS Convention, Resolution 4).

February 1, 1995 New compulsory ships constructed on or after this date must comply with all GMDSS requirements. (47 C.F.R. § 80.1065(b)(3)).

February 1, 1995 Passenger ships and cargo ships of 500 tons gross tonnage and over constructed before February 1, 1992, must carry at least two radar transponders (one on each side of ship) and at least three two-way VHF radiotelephones for use in survival craft. Cargo ships of 300-500 tons gross tonnage constructed before February 1, 1992, must carry at least one radar transponder and at least two two-way VHF radiotelephones. (47 C.F.R. § 80.1095).

February 1, 1999 All compulsory ships must meet all GMDSS requirements. (47 C.F.R. § 80.1065(b)(4)).

*Note: Although VHF Channel 70 EPIRBs and INMARSAT 1.6 GHz EPIRBs are also allowed, they are not permitted to be used until equipment standards are adopted and type acceptance has been issued for these EPIRBs. Until that time, the 406 MHz EPIRB is the only EPIRB acceptable for use under the FCC's GMDSS regulations.

APPENDIX D

Regulatory Flexibility Act Final Analysis

1. In accordance with Section 605(b) of the Regulatory Flexibility Act of 1980, 5 U.S.C. § 605(b), our final analysis of the economic impact of these amendments to small entities is as follows:

2. *Need and purpose of this action:* The amendments to the Commission's Rules contained in this *Report and Order* implement the Global Maritime Distress and Safety System. Because of advances in communications technology, the GMDSS will better ensure the safety of life and property at sea than the current distress and safety communications system. The changes are needed to improve maritime distress and safety communications and to ensure that the United States fulfills its international obligations under the Safety of Life at Sea Convention. Refusal to implement the changes will result in failure of the United States to uphold its international obligations and will endanger American lives and property by the perpetuation of an obsolete system incapable of communicating with ships and shore facilities of the major maritime nations.

3. *Summary of issues raised by public comments in response to the Initial Regulatory Flexibility Act Analysis:* The initial analysis in the *Notice* stated that this action would not have a significant economic impact on a substantial number of small entities, as the rules apply to larger cargo and passenger vessels on international voyages and not to smaller vessels, such as recreational or fishing vessels. One commenter, Marine Communications Inc., states that this action would have a significant economic impact on a number of small entities, including manufacturers and maintainers of electronic equipment and entities which provide communications. MC suggests that we issue a new notice of proposed rule making, and publish that notice in maritime trade publications, in order to allow small entities to become aware of this action and comment upon proposed rules. We disagree. First, we reiterate that the majority of the entities affected are not small entities. These rules pertain to cargo ships of 300 gross tons or more and passenger ships on international voyages. Second, while all entities affected by this action will have to change some equipment and procedures, the equipment and procedures involved are already in use to a great extent in the maritime community. No drastically new technology is involved. Thus, adjusting to the GMDSS will not have a significant economic impact on these entities. Most will experience an increase in economic activity as a result of this action. Finally, the broad dissemination in trade publications information about the GMDSS and the pendency of this action gave effective notice to the entire maritime community, as is reflected in the broad spectrum of commenters. We do not feel that the action proposed by MC would significantly increase public awareness of, or response to, this action.

4. *Significant alternatives considered and rejected:* The alternatives to implementing the GMDSS are retaining the current distress and safety system or adopting some other non-GMDSS system. Taking either of these alternatives would both cause the United States to fail under its international obligations and diminish the safety of life at sea, as United States ships would have distress communications systems incompatible with the system used by

the rest of the world. We conclude that the amendments in this *Report and Order* represent the most effective and least burdensome method of complying with our international responsibilities and ensuring the safety of lives and property at sea.

APPENDIX E

Parts 13 and 80 of Title 47 of the Code of Federal Regulations are amended as follows:

1. The authority citation for Part 13 continues to read as follows:

AUTHORITY: Secs. 4, 303, 48 Stat. 1066, 1082 as amended; 47 U.S.C. 154, 303.

2. In Section 13.2, paragraph (b)(7) is added to read as follows:

§ 13.2 Classification of operator licenses and endorsements.

* * * * *

(b) ***

(7) GMDSS Radio Operator's License (general radio operator's certificate).

* * * * *

3. In Section 13.21, paragraph (a)(7) is added to read as follows:

§ 13.21 Examination elements.

* * * * *

(a) ***

(7) *GMDSS operating practices.* Radio operating procedures and practices of the knowledge and qualifications enumerated below:

(i) Detailed practical knowledge of the operation of all GMDSS sub-systems and equipment;

(ii) Ability to send and receive correctly by radio telephone and narrow-band direct-printing telegraphy;

(iii) Detailed knowledge of the regulations applying to radiocommunications, knowledge of the documents relating to charges for radiocommunications and knowledge of those provisions of the International Convention for the Safety of Life at Sea which relate to radio; and

(iv) Sufficient knowledge of English to be able to express themselves satisfactorily both orally and in writing.

(v) Knowledge of and ability to perform each of the functions listed in § 80.1081.

(vi) Knowledge covering the requirements set forth in IMO Assembly Resolution on Training for Radio Personnel (GMDSS), Annex 3.

* * * * *

4. In Section 13.22, paragraph (b)(6) is added to read as follows:

§ 13.22 Required qualifications.

* * * * *

(b)***

(6) GMDSS Radio Operator's License.

(i) Written examinations covering elements 1, 2, and 7.

* * * * *

5. The authority citation for Part 80 continues to read as follows:

AUTHORITY: Secs. 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, unless otherwise noted. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-155, 301-609; 3 UST 3450, 3 UST 4726, 12 UST 2377.

6. Part 80 is revised by adding Subpart W to read as follows:

PART 80 - STATIONS IN THE MARITIME SERVICES

Subpart W - Global Maritime Distress and Safety System (GMDSS)

GENERAL PROVISIONS

80.1065	Applicability
80.1067	Inspection of station
80.1069	Maritime sea areas
80.1071	Exemptions
80.1073	Radio operator requirements for ship stations
80.1074	Radio maintenance personnel for at-sea maintenance
80.1075	Radio records
80.1077	Frequencies available

EQUIPMENT REQUIREMENTS FOR SHIP STATIONS

80.1081	Functional requirements
80.1083	Ship radio installations
80.1085	Ship radio equipment - General
80.1087	Ship radio equipment - Sea area A1
80.1089	Ship radio equipment - Sea areas A1 and A2
80.1091	Ship radio equipment - Sea areas A1, A2, and A3
80.1093	Ship radio equipment - Sea areas A1, A2, A3 and A4
80.1095	Survival craft equipment
80.1099	Ship sources of energy
80.1101	Performance standards
80.1103	Equipment authorization
80.1105	Maintenance requirements

OPERATING PROCEDURES FOR DISTRESS AND SAFETY COMMUNICATIONS

80.1109	Distress, urgency, and safety communications
80.1111	Distress Alerting
80.1113	Transmission of a distress alert
80.1115	Transmission of a distress alert by a station not itself in distress
80.1117	Procedure for receipt and acknowledgement of distress alerts
80.1119	Receipt and acknowledgement of distress alerts by coast stations and coast earth stations
80.1121	Receipt and acknowledgement of distress alerts by ship stations and ship earth stations
80.1123	Watch requirements for ship stations
80.1125	Search and rescue coordinating communications
80.1127	On-scene communications
80.1129	Locating and homing signals
80.1131	Transmissions of urgency communications
80.1133	Transmissions of safety communications
80.1135	Transmission of maritime safety information

Subpart W - Global Maritime Distress and Safety System (GMDSS)

This subpart contains the rules applicable to the Global Maritime Distress and Safety System (GMDSS). Every ship of the United States subject to Part II of Title III of the Communications Act or the Safety Convention must comply with the provisions of this subpart. The rules in this subpart are to be read in conjunction with the applicable requirements contained elsewhere in this part; however, in case of conflict, the provisions of this subpart shall govern with respect to the GMDSS. For the purposes of this subpart, distress and safety communications include distress, urgency, and safety calls and messages.

NOTE: No provision of this subpart is intended to eliminate, or in anyway modify, other requirements contained in this part with respect to Part II of Title III of the Communications Act.

GENERAL PROVISIONS

§ 80.1065 Applicability.

(a) The regulations contained in § 80.1119 apply to public coast stations and coast earth stations as of February 1, 1992.

(b) The regulations contained within this subpart apply to all passenger ships regardless of size and cargo ships of 300 tons gross tonnage and upwards as follows:

(1) Ships must comply with §§ 80.1085(a)(4) and 80.1085(a)(6) not later than August 1, 1993.

(2) Ships constructed on or after February 1, 1992, must comply with § 80.1095 as of that date. All other ships must comply with this section as of February 1, 1995.

(3) Ships constructed on or after February 1, 1995, must comply with all requirements of this subpart.

(4) Ships constructed before February 1, 1995, must comply with all requirements of this subpart as of February 1, 1999.

(5) During the period between February 1, 1992, and February 1, 1999, all ships must comply with:

(i) The requirements of this subpart;

(ii) The requirements of Chapter IV of the International Convention for the Safety of Life at Sea, 1974, in force prior to February 1, 1992 (see Subparts Q and R of this part); or

(iii) For ships operated solely on domestic voyages, the requirements of § 80.836.

(6) The expression "ships constructed" means "ships the keels of which are laid, or construction identifiable with a specific ship begins and assembly of that ship has commenced comprising at least 50 tons gross tonnage or 1% of the estimated mass of all structural material, whichever is less.

(c) The requirements of this subpart do not modify the requirements for ships navigated on the Great Lakes or small passenger boats. The requirements contained in the Agreement Between the United States of America and Canada for Promotion of Safety on the Great Lakes by Means of Radio, 1973, continue to apply (see subpart T of this part). The requirements contained in Part III of Title III of the Communications Act continue to apply (see subpart S of this part).

(d) No provision in this subpart is intended to prevent the use by any ship, survival craft, or person in distress, of any means at their disposal to attract attention, make known their position and obtain help.

§ 80.1067 Inspection of station.

(a) Ships must have the required equipment inspected at least once every 12 months. If the ship is in compliance with the requirements of the Safety Convention, a Safety Certificate will be issued; if in compliance with the Communications Act, the license will be endorsed accordingly. The effective date of the ship safety certificate is the date the station is found to be in compliance or not later than one business day later.

(b) Certificates issued in accordance with the Safety Convention must be posted in a prominent and accessible place on the ship.

§ 80.1069 Maritime sea areas.

(a) For the purpose of this subpart, a ship's area of operation is defined as follows:

Sea area A1. An area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available as defined by the International Maritime Organization.

Sea area A2. An area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available as defined by the International Maritime Organization.

Sea area A3. An area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available.

Sea area A4. An area outside sea areas A1, A2 and A3.

(b) Maritime sea areas are delineated in the International Maritime Organization Publication *GMDSS Master Plan of Shore-Based Facilities*. The *Master Plan* can be purchased from the International Maritime Organization, 4 Albert Embankment, London SE1 7SR, United Kingdom.

§ 80.1071 Exemptions

(a) In certain circumstances, partial or conditional exemptions may be granted to individual ships from the requirements of §§ 80.1085, 80.1087, 80.1089, 80.1091, and 80.1093 provided: such ships comply with the functional requirements of § 80.1081 and a showing is made that such an exemption will not have a material effect upon the general efficiency of the service for the safety of all ships.

(b) An exemption may be granted under paragraph (a) of this section only:

(1) If the conditions affecting safety are such as to render the full application of §§ 80.1085, 80.1087, 80.1089, 80.1091, and 80.1093 of this part unreasonable or unnecessary or otherwise not in the public interest;

(2) In exceptional circumstances, for a single voyage outside the sea area or sea areas for which the ship is equipped; or

(3) Prior to February 1, 1999, when the ship will be taken permanently out of service within two years of a requirement date specified in § 80.1065 of this part.

§ 80.1073 Radio operators requirements for ship stations.

(a) Ships must carry at least two persons holding GMDSS Radio Operator's Licenses as specified in § 13.2 of the Commission's Rules for distress and safety radiocommunications purposes. The GMDSS Radio Operator's License qualifies personnel as GMDSS radio operators for the purposes of operating GMDSS radio installations, including basic equipment adjustments as denoted in knowledge requirements specified in § 13.21 of the Commission's Rules.

(1) One of the qualified GMDSS radio operators must be designated to have primary responsibility for radiocommunications during distress incidents.

(2) A second qualified GMDSS radio operator must be designated as backup for distress and safety radiocommunications.

(b) A qualified GMDSS radio operator, and a qualified backup, as specified in paragraph (a) of this section must be:

(1) Available to act as the dedicated radio operator in cases of distress as described in § 80.1109(a);

(2) Designated to perform as part of normal routine each of the applicable communications described in § 80.1109(b); and

(3) Responsible for selecting HF DSC guard channels and receiving scheduled maritime safety information broadcasts.

(4) Designated to perform communications described in § 80.1109(c).

(5) Responsible for ensuring that the watches required by § 80.1123 are properly maintained.

(6) Responsible for ensuring that the ship's navigation position is entered, either manually or automatically through a navigation receiver, into all installed DSC equipment at least every four hours while the ship is underway.

§ 80.1074 Radio maintenance personnel for at-sea maintenance.

(a) Ships that elect the at-sea option for maintenance of GMDSS equipment (*see* § 80.1105) must carry at least one person who qualifies as a GMDSS radio maintainer, as specified in paragraph (b) of this section, for the maintenance and repair of equipment specified in this subpart. This person may be, but need not be, the person designated as GMDSS radio operator as specified in § 80.1073.

(b) The following licenses qualify personnel as GMDSS radio maintainers to perform at-sea maintenance of equipment specified in this subpart. For the purposes of this subpart, no order is intended by this listing or the alphanumeric designator.

(1) T-1: First Class Radiotelegraph Operator's Certificate

(2) T-2: Second Class Radiotelegraph Operator's Certificate

(3) G: General Radiotelephone Operator License

(c) While at sea, all adjustments of radio installations, servicing, or maintenance of such installations that may affect the proper operation of the GMDSS station must be performed by, or under the immediate supervision and responsibility of, a qualified GMDSS radio maintainer as specified in paragraph (b) of this section.

(d) The GMDSS radio maintainer must possess the knowledge covering the requirements set forth in IMO Assembly on Training for Radio Personnel (GMDSS), Annex 5 and IMO Assembly on Radio Maintenance Guidelines for the Global Maritime Distress and Safety System related to Sea Areas A3 and A4.

§ 80.1075 Radio records

A record must be kept, as required by the Radio Regulations and § 80.409(a), (b) and (e), of all incidents connected with the radiocommunication service which appear to be of importance to safety of life at sea.

§ 80.1077 Frequencies

The following table describes the frequencies used in the Global Maritime Distress and Safety System:

Alerting

406 EPIRBs	406-406.1 MHz (Earth-to-space) 1544-1545 MHz (space-to-Earth)
INMARSAT A or C SES	1626.5-1645.5 MHz (Earth-to-space)
VHF DSC Ch. 70	156.525 MHz ¹
MF/HF DSC ²	2187.5 kHz ³ , 4207.5 kHz, 6312 kHz, 8414.5 kHz, 12577 kHz, and 16804.5 kHz

On-scene communications

VHF Ch. 16	156.8 MHz
MF radiotelephony	2182 kHz
NBDP	2174.5 kHz

Communications involving aircraft

On-scene, including search and rescue	156.8 MHz ⁴ , 121.5 MHz ⁵ , 123.1 MHz, 156.3 MHz, 2182 kHz, 3023 kHz, 4125 kHz, and 5680 kHz ⁶
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Locating signals

406 MHz EPIRB beacons	121.5 MHz
9 GHz radar transponders	9200-9500 MHz

Maritime safety information (MSI)

International NAVTEX	518 kHz ⁷
Warnings	490 kHz ⁸ , 4209.5 kHz ⁹
NBDP	4210 kHz, 6314 kHz, 8416.5 kHz, 12579 kHz, 16806.5 kHz, 19680.5 kHz, 22376 kHz, 26100.5 kHz
Satellite	1530-1545 MHz (space-to-Earth) ¹⁰

General distress and safety communications and calling

Satellite	1530-1544 MHz (space-to-Earth) and 1626.5-1645.5 MHz (Earth-to-space) ¹⁰
Radiotelephony	2182 kHz, 4125 kHz, 6215 kHz, 8291 kHz, 12290 kHz, 16420 kHz, and 156.8 MHz
NBDP	2174.5 kHz, 4177.5 kHz, 6268 kHz, 8376.5 kHz, 12520 kHz, and 16695 kHz
DSC	2187.5 kHz, 4207.5 kHz, 6312 kHz, 8414.5 kHz, 12577 kHz, 16804.5 kHz, and 156.525 MHz

Survival craft

VHF radiotelephony MHz frequency	156.8 MHz and one other 156-174
9 GHz radar transponders	9200-9500 MHz

FOOTNOTES TO APPENDIX E

¹ Frequency 156.525 MHz can be used for ship-to-ship alerting and, if within sea area A1, for ship-to-shore alerting.

² For ships equipped with MF/HF equipment, there is a watch requirement on 2187.5 kHz, 8414.5 kHz, and one other frequency.

³ Frequency 2187.5 kHz can be used for ship-to-ship alerting and, if within sea areas A2, for ship-to-shore alerting.

⁴ Frequency 156.8 MHz may also be used by aircraft for safety purposes only.

⁵ Frequency 121.5 MHz may be used by ships for aeronautical distress and urgency purposes.

⁶ The priority of use for ship-aircraft communications is 4125 kHz, then 3023 kHz. Additionally, frequencies 123.1 MHz, 3023 kHz, and 5680 kHz can be used by land stations engaged in coordinated search and rescue operations.

⁷ The international NAVTEX frequency 518 kHz is the primary frequency for receiving maritime safety information. The other frequencies are used only to augment the coverage or information provided on 518 kHz.

⁸ Frequency 490 kHz cannot be used for MSI employing NBDP transmissions until February 2, 1999.

⁹ Frequency 4209.5 kHz is not used in the United States (see 47 C.F.R. § 2.106 footnote 520A).

¹⁰ In addition to EPIRBs, 1544-1545 MHz can be used for narrowband distress and safety operations and 1645.5-1646.5 MHz can be used for relay of distress alerts between satellites. Feeder links for satellite communications are assigned from the fixed satellite service, see 47 C.F.R. § 2.106.

EQUIPMENT REQUIREMENTS FOR SHIP STATIONS**§ 80.1081 Functional requirements**

(a) Ships, while at sea, must be capable:

(1) Except as provided in §§ 80.1087(a)(1) and 80.1091(a)(4)(iii), of transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

(2) Of receiving shore-to-ship distress alerts;

(3) Of transmitting and receiving ship-to-ship distress alerts;

(4) Of transmitting and receiving search and rescue co-ordinating communications;

(5) Of transmitting and receiving on-scene communications;

(6) Of transmitting and receiving signals for locating;

(7) Of transmitting and receiving maritime safety information;

(8) Of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks; and

(9) Of transmitting and receiving bridge-to-bridge communications.

§ 80.1083 Ship radio installations

(a) Ships must be provided with radio installations capable of complying with the functional requirements prescribed by § 80.1081 throughout its intended voyage and, unless exempted under § 80.1071, complying with the requirements of § 80.1085 and, as appropriate for the sea area of areas through which it will pass during its intended voyage, the requirements of either §§ 80.1087, 80.1089, 80.1091, or 80.1093.

(b) The radio installation must:

(1) Be so located that no harmful interference of mechanical, electrical or other origin affects its proper use, and so as to ensure electromagnetic compatibility and avoidance of harmful interaction with other equipment and systems;

(2) Be so located as to ensure the greatest possible degree of safety and operational availability;

(3) Be protected against harmful effects of water, extremes of temperature and other adverse environmental conditions;

(4) Be provided with reliable, permanently arranged electrical lighting, independent of the main and emergency sources of electrical power, for the adequate illumination of the radio controls for operating the radio installation; and

(5) Be clearly marked with the call sign, the ship station identity and other codes as applicable for the use of the radio installation.

(c) Control of the VHF radiotelephone channels required for navigational safety must be immediately available on the navigating bridge convenient to the conning position and, where necessary, facilities should be available to permit radiocommunications from the wings of the navigating bridge. Portable VHF equipment may be used to meet the latter provision.

§ 80.1085 Ship radio equipment - General

This section contains the general equipment requirements for all ships subject to this subpart.

(a) Ships must be provided with:

(1) A VHF radio installation capable of transmitting and receiving:

(i) DSC on the frequency 156.525 MHz (channel 70), and it must be able to initiate the transmission of distress alerts on channel 70 from the position from which the ship is normally navigated; and

(ii) Radiotelephony on the frequencies 156.300 MHz (channel 6), 156.650 MHz (channel 13), and 156.800 MHz (channel 16);

(2) A dedicated, non-scanning radio installation capable of maintaining a continuous DSC watch on VHF channel 70 which may be separate from, or combined with, that required by paragraph (a)(1)(i) of this section;

(3) A radar transponder capable of operating in the 9 GHz band, which must be stowed so that it is easily utilized (this transponder may be one of those required by § 80.1095(b) for a survival craft);

(4) A receiver capable of receiving international NAVTEX service broadcasts;

(5) If the ship is engaged on voyages in any area of INMARSAT coverage in which an international NAVTEX service is not provided, a radio facility for reception of maritime safety information by the INMARSAT enhanced

group calling system, *i.e.*, SafetyNet, (this requirement does not apply to ships engaged exclusively on voyages in areas where an HF direct-printing telegraphy maritime safety information service, as identified by the IMO GMDSS Master Plan Publication, is provided and the ship is fitted with equipment capable of receiving such service); and

(6) A satellite emergency position-indicating radio beacon (satellite EPIRB) which must be:

(i) Capable of transmitting a distress alert through the polar orbiting satellite service operating in the 406 MHz band (406 MHz EPIRB); and

(ii) Installed in an easily accessible position, ready to be manually released and capable of being carried by one person into a survival craft, capable of floating free if the ship sinks and of being automatically activated when afloat, and capable of being activated manually.

(b) Until February 1, 1999, all ships must be equipped with a radio installation consisting of a radiotelephone distress frequency 2182 kHz watch receiver prescribed by § 80.807. This requirement does not apply to ships constructed on or after February 1, 1997.

(c) Until February 1, 1999, all ships, except ships engaged on voyages in sea area A1 only, must be equipped with a device for generating the 2182 kHz radiotelephone alarm signal as prescribed by § 80.807. This requirement does not apply to ships constructed on or after February 1, 1997.

(d) Ships must carry the most recent edition of the IMO publication entitled *GMDSS Master Plan of Shore-Based Facilities*. Notice of new editions will be published in the Federal Register and copies may be obtained from: International Maritime Organization, 4 Albert Embankment, London SE1 7SR, United Kingdom.

§ 80.1087 Ship radio equipment - Sea area A1

This section contains the additional equipment requirements for ships that remain within sea area A1 at all times.

(a) In addition to meeting the requirements of § 80.1085, ships engaged on voyages exclusively in sea area A1 must be provided with a radio installation capable of initiating the transmission of ship-to-shore distress alerts from the position from which the ship is normally navigated, operating either:

(1) On VHF using DSC; or

(2) Through the polar orbiting satellite service on 406 MHz (this requirement may be fulfilled by the 406 MHz EPIRB, required by § 80.1085(a)(6), either by installing the 406 MHz EPIRB close to, or by allowing remote activation from, the position from which the ship is normally navigated); or

(3) On MF using DSC if the ship is engaged on voyages within coverage of MF coast stations equipped with DSC; or

(4) On HF using DSC; or

(5) Through the INMARSAT geostationary satellite service if within INMARSAT coverage. This requirement may be fulfilled by an INMARSAT ship earth station capable of two way communication.

(b) The VHF radio installation, required by § 80.1085(a)(1), must also be capable of transmitting and receiving general radiocommunications using radiotelephony.

§ 80.1089 Ship radio equipment - Sea areas A1 and A2

This section contains the additional equipment requirements for ships that remain within sea areas A1 or A2 at all times. Ships fitting in accordance with this section satisfy the sea area A1 requirements denoted in § 80.1087.

(a) In addition to meeting the requirements of § 80.1085 of this part, ships engaged on voyages beyond sea area A1, but remaining within sea area A2, must be provided with:

(1) An MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

- (i) 2187.5 kHz using DSC; and
- (ii) 2182 kHz using radiotelephony;

(2) A radio installation capable of maintaining a continuous DSC watch on the frequency 2187.5 kHz which may be separate from or combined with, that required by paragraph (a)(1)(i) of this section; and

(3) Means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF operating either

(i) Through the polar orbiting satellite service on 406 MHz (this requirement may be fulfilled by the 406 MHz EPIRB required by § 80.1085(a)(6), either by installing the 406 MHz EPIRB close to, or by allowing remote activation from, the position from which the ship is normally navigated); or

(ii) On HF using DSC; or

(iii) Through the INMARSAT geostationary satellite service if within INMARSAT coverage; this requirement may be fulfilled by an INMARSAT ship earth station.

(b) It must be possible to initiate transmission of distress alerts by the radio installations specified in paragraphs (a)(1) and (a)(3) of this section from the position from which the ship is normally navigated.

(c) Ships subject to this section must be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy by either:

(1) A radio installation operating on working frequencies in the bands between 1605-4000 kHz or between 4000-27500 kHz (this requirement may be fulfilled by the addition of this capability to the equipment required by paragraph (a)(1) of this section); or

(2) An INMARSAT ship earth station.

§ 80.1091 Ship radio equipment - Sea areas A1, A2, and A3

This section contains the additional equipment requirements for ships that remain within sea areas A1, A2, or A3 at all times. Ships fitting in accordance with this section satisfy the requirements denoted in §§ 80.1087 and 80.1089 for sea areas A1 and A2. Ships fitting in accordance to this section have the option to comply with either the requirements of paragraph (a) or (b) of this section.

(a) In addition to meeting the requirements of § 80.1085, ships subject to this section must be provided with:

(1) An INMARSAT ship earth station capable of:

(i) Transmitting and receiving distress and safety communications using direct-printing telegraphy;

(ii) Initiating and receiving distress priority calls;

(iii) Maintaining watch for shore-to-ship distress alert, including those directed to specifically defined geographical areas;

(iv) Transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy; and

(2) An MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

(i) 2187.5 kHz using DSC; and

(ii) 2182 kHz using radiotelephony; and

(3) A radio installation capable of maintaining a continuous DSC watch on the frequency 2187.5 kHz which may be separate from or combined with that required by paragraph (a)(2)(i) of this section; and

(4) Means of initiating the transmission of ship-to-shore distress alerts by a radio service operating either:

(i) Through the polar orbiting satellite service on 406 MHz (this requirement may be fulfilled by the 406 MHz EPIRB required by § 80.1085(a)(6), either by installing the 406 MHz EPIRB close to, or by allowing remote activation from, the position from which the ship is normally navigated); or

(ii) On HF using DSC; or

(iii) Through the INMARSAT geostationary satellite service, by an additional ship earth station.

(b) In addition to meeting the requirements of § 80.1085, ships subject to this section must be provided with:

(1) An MF/HF radio installation capable of transmitting and receiving on all distress and safety frequencies in the bands between 1605-27500 kHz using DSC, radiotelephony, and narrow-band direct-printing telegraphy; and

(2) Equipment capable of maintaining DSC watch on 2187.5 kHz, 8414.5 kHz and on at least one of the distress and safety DSC frequencies 4207.5 kHz, 6312 kHz, 12577 kHz, or 16804.5 kHz although it must be possible to select any of these DSC distress and safety frequencies at any time (this equipment may be separate from, or combined with, the equipment required by paragraph (b)(1) of this section); and

(3) Means of initiating the transmission of ship-to-shore distress alerts by a radiocommunication service other than HF operating either:

(i) Through the polar orbiting satellite service on 406 MHz (this requirement may be fulfilled by the 406 MHz EPIRB required by § 80.1085(a)(6), either by installing the 406 MHz EPIRB close to, or by allowing remote activation from, the position from which the ship is normally navigated); or

(ii) Through the INMARSAT geostationary satellite service (this requirement may be fulfilled by an INMARSAT ship earth station).

(4) In addition, ships must be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy by an MF/HF radio installation operating on working frequencies in the bands between 1605-4000 kHz and between 4000-27500 kHz (this requirement may be fulfilled by the addition of this capability to the equipment required by paragraph (b)(1) of this section).

(c) It must be possible to initiate transmission of distress alerts by the radio installations specified in paragraphs (a)(1), (a)(2), (a)(4), (b)(1), and (b)(3) of this section from the position from which the ship is normally navigated.

§ 80.1093 Ship radio equipment - Sea areas A1, A2, A3 and A4

This section contains the additional equipment requirements for ships that sail in all sea areas, *i.e.*, sea areas A1, A2, A3, and A4. Ships fitting in accordance with this section satisfy the requirements denoted in §§ 80.1087, 80.1089, and 80.1091 of this part for sea areas A1, A2, and A3.

(a) In addition to meeting the requirements of § 80.1085, ships engaged on voyages in all sea areas must be provided with the radio installations and equipment required by § 80.1091(b), except that the equipment required by § 80.1091(b)(3)(ii) cannot be accepted as an alternative to that required by regulation § 80.1091(b)(3)(i), which must always be provided.

(b) Ships engaged on voyages in all sea areas also must comply with the requirements of § 80.1091(c).

§ 80.1095 Survival craft equipment

(a) At least three two-way VHF radiotelephone apparatus must be provided on every passenger ship and on every cargo ship of 500 tons gross tonnage and upwards. At least two two-way VHF radiotelephone apparatus must be provided on every cargo ship of between 300-500 tons gross tonnage. Portable two-way VHF radiotelephones must be stowed in such locations that they can be rapidly placed in any survival craft other than liferafts required by Regulation III/26.1.4 of the SOLAS Convention. Alternatively, survival craft may be fitted with a fixed two-way VHF radiotelephone installation. Two-way VHF radiotelephone apparatus, portable or fixed, must conform to performance standards as specified in § 80.1101. Two-way VHF radiotelephone apparatus provided on board ships prior to February 1, 1992, and not complying fully with the performance standards specified in § 80.1101, may be used until February 1, 1999, provided it is compatible with approved two-way VHF radiotelephone apparatus.

(b) At least one radar transponder must be carried on each side of every passenger ship and every cargo ship of 500 tons gross tonnage and upwards. At least one radar transponder must be carried on every cargo ship of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage. Such radar transponders must conform to performance standards as specified in § 80.1101. The radar transponders must be stowed in such locations that they can be rapidly placed in any survival craft other than liferafts required on cargo ships in forward and aft areas (see Regulation III/26.1.4 of the SOLAS Convention). Alternatively, one radar transponder must be stowed in each survival craft other than those required by Regulation III/26.1.4 of the SOLAS Convention. One of these radar transponders may be the radar transponder required by § 80.1085(a)(3).

(c) Survival craft equipment must be tested at intervals not to exceed twelve months. For batteries used for survival craft equipment, the month and year of its manufacture must be permanently marked on the battery. Also, the month and year upon which 50 percent of its useful life will expire must be permanently marked on both the

battery and the outside of the transmitter. Batteries must be replaced if 50 percent of their useful life has expired or if the transmitter has been used in an emergency situation.

§ 80.1099 Ship sources of energy

(a) There must be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of a reserve sources of energy for the radio installations.

(b) A reserve sources of energy to supply radio installations must be provided on every ship for the purpose of conducting distress and safety radiocommunications, in the event of failure of the ship's main and emergency sources of electrical power. The reserve sources of energy must be capable of simultaneously operating the VHF radio installation required by § 80.1085(a)(1) and, as appropriate for the sea area or sea areas for which the ship is equipped, either the MF radio installation required by § 80.1089(a)(1), the MF/HF radio installation required by §§ 80.1091(a)(2)(i) or 80.1093(a), or the INMARSAT ship earth station required by § 80.1091(a)(1) and any of the additional loads mentioned in paragraphs (d), (e), and (h) of this section for a period of at least:

(1) One hour, on ships constructed on or after February 1, 1995;

(2) One hour, on ships constructed before February 1, 1995, if the emergency source of electrical power complies fully with all relevant requirements of SOLAS, Chapter II-1, Regulation 42 or 43 (as amended); or

(3) Six hours, on ships constructed before February 1, 1995, and on cargo ships of less than 500 tons gross tonnage, if the emergency source of electrical power is not provided or does not comply fully with all relevant requirements of SOLAS, Chapter II-1, Regulation 42 or 43 (as amended).

(c) The reserve sources of energy need not supply independent HF and MF radio installations at the same time. The reserve sources of energy must be independent of the propelling power of the ship and the ship's electrical system.

(d) Where, in addition to the VHF radio installation, two or more of the other radio installations, referred to in paragraph (b) of this section, can be connected to the reserve sources of energy, they must be capable of simultaneously supplying, for one hour, as specified in paragraph (b) of this section, the VHF radio installation and:

(1) All other radio installations which can be connected to the reserve sources of energy at the same time; or

(2) Whichever of the other radio installations will consume the most power, if only one of the other radio installations can be connected to the reserve sources of energy at the same time as the VHF radio installation.

(e) The reserve sources of energy may be used to supply the electrical lighting required by § 80.1083(b)(4).

(f) Where a reserve source of energy consists of a rechargeable accumulator battery or batteries:

(1) A means of automatically charging such batteries must be provided which must be capable of recharging them to minimum capacity requirements within 10 hours; and

(2) The capacity of the battery or batteries must be checked, using an appropriate method, at intervals not exceeding 12 months. These checks must be performed when the vessel is not at sea.

(g) The accumulator batteries which provide a reserve source of energy must be installed to ensure: the highest degree of service, a reasonable lifetime, reasonable safety; that the battery temperatures remain within the manufacturer's specifications whether under charge or idle; and that when fully charged, the batteries will provide at least the minimum required hours of operation under all weather conditions.

(h) If an uninterrupted input of information from the ship's navigational or other equipment to a radio installation required by this subpart is needed to ensure its proper performance, means must be provided to ensure the continuous supply of such information in the event of failure of the ship's main or emergency source of electrical power.

(i) An uninterruptible power supply or other means of ensuring a continuous supply of electrical power, within equipment tolerances, shall be provided to all GMDSS equipment that could be affected by normal variations and interruptions of ship's power.

§ 80.1101 Performance standards

(a) All equipment specified in this subpart must meet the general requirements for shipboard equipment as listed below which are incorporated by reference.

(1) IMO Resolution A.694(17), "General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System and for Electronic Navigational Aids."

(2) CCITT Recommendation E.161, "Arrangement of Figures, Letters and Symbols on Telephones and Other Devices that Can Be Used for Gaining Access to a Telephone Network."

(3) CCITT Recommendation Q.11, "Numbering Plan of the ISDN Era."

(4) IEC Publication 92-101, "Electrical Installations in Ships." IEC Publication 533, "Electromagnetic Compatibility of Electrical and Electronic Installations in Ships." English version.

(5) IEC Publication 945, "Marine Navigational Equipment." English version.

(6) ISO Standard 3791, "Office Machines and Data Processing Equipment - Keyboard Layouts for Numeric Applications." English version.

(b) The equipment specified in this subpart must also conform to the appropriate performance standards listed below which are incorporated by reference.

(1) NAVTEX receivers:

(i) IMO Resolution A.525(13), "Performance Standards for Narrow-band Direct Printing Telegraph Equipment for the Reception of Navigational and Meteorological Warnings and Urgent Information to Ships."

(ii) CCIR Recommendation 540-2, "Operational and Technical Characteristics for an Automated Direct-printing Telegraph System for Promulgation of Navigational and Meteorological Warnings and Urgent Information to Ships."

(2) VHF radio equipment:

(i) IMO Resolution A.609(15), "Performance Standards for Shipborne VHF Radio Installations Capable of Voice Communication and Digital Selective Calling."

(ii) CCIR Recommendation 493-4, "Digital Selective-calling System for use in the Maritime Mobile Service."

(3) MF radio equipment:

(i) IMO Resolution A.610(15), "Performance Standards for Shipborne MF Radio Installations Capable of Voice Communication and Digital Selective Calling."

(ii) CCIR Recommendation 493-4, "Digital Selective-calling System for use in the Maritime Mobile Service."

(4) MF/HF radio equipment:

(i) IMO Resolution A.613(15), "Performance Standards for Shipborne MF/HF Radio Installations capable of Voice Communication, Narrow-band Direct Printing and Digital Selective Calling."

(ii) CCIR Recommendations 493-4, "Digital Selective-calling System for use in the Maritime Mobile Service."

(iii) CCIR Recommendation 625-1, "Direct-printing Telegraph Equipment Employing Automatic Identification in the Maritime Mobile Service." Equipment may conform to CCIR Recommendation 476-4, "Direct-Printing Telegraph Equipment in the Maritime Mobile Service," in lieu of CCIR Recommendation 625-1, where such equipment was installed on ships prior to February 1, 1993.

(5) 406 MHz EPIRBs:

(i) IMO Resolution A.611(15), "Performance Standards for Float-free Satellite Emergency Position-indicating Radio Beacons Operating on 406 MHz."

(ii) IMO Resolution A.662(16), "Performance Standards for Float-free Release and Activation Arrangements for Emergency Radio Equipment."

(iii) CCIR Recommendation 633-1, "Transmission Characteristics of a Satellite Emergency Position-indicating Radiobeacon (Satellite EPIRB) System Operating Through a Low Polar-orbiting Satellite System in the 406 MHz Band."

(iv) The 406 MHz EPIRBs must also comply with § 80.1061.

(6) 9 GHz radar transponders:

(i) IMO Resolution A.604(15), "Performance Standards for Survival Craft Radar Transponders for Use in Search and Rescue Operations."

(ii) CCIR Recommendation 628-1, "Technical Characteristics for Search and Rescue Radar Transponders."

(7) Two-way VHF radiotelephone:

(i) IMO Resolution A. 605(15), "Performance Standards for Survival Craft Two-way VHF Radiotelephone Apparatus."

(8) INMARSAT-A SES:

(i) IMO Resolution A.608(15), "Performance Standards for Ship Earth Stations Capable of Two-way Communications."

(ii) CCIR Recommendation 493-4, "Digital Selective-calling System for use in the Maritime Mobile Service."

(9) INMARSAT-C SES:

(i) IMO Resolution A.663(16), "Performance Standards for INMARSAT Standard-C Ship Earth Stations Capable of Transmitting and Receiving Direct-printing Communications."

(ii) CCIR Recommendation 493-4, "Digital Selective-calling System for use in the MAritime Mobile Service."

(10) INMARSAT EGC:

(i) IMO Resolution A.664(16), "Performance Standards for Enhanced Group Call Equipment."

(c) The above-referenced documents have been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Identification data and place to purchase for each of the above-referenced documents are listed as follows:

(1) Copies of IMO Resolutions, the 1974 SOLAS Convention, and 1983 and 1988 SOLAS Convention amendments can be purchased from Publications, International Maritime Organization, 4 Albert Embankment, London SE1 7SR, United Kingdom.

(i) IMO Resolution A.525(13) is contained in the *Resolutions and Other Decisions of the Assembly of the International Maritime Organization*, 13th Session, 1983, (IMO, London, 1984), Sales Number 073 84.07.E.

(ii) IMO Resolutions A.604(15), A.605(15), A.608(15), A.609(15), A.610(15), A.611(15) and A.613(15) are contained in the *Resolutions and Other Decisions of the Assembly of the International Maritime Organization*, 15th Session, 1987, (IMO, London, 1988), Sales Number 130 88.03.E.

(iii) IMO Resolutions A.663(16) and A.664(16) are contained in the *Resolutions and Other Decisions of the Assembly of the International Maritime Organization*, 16th Session, 1989, (IMO, London, 1990), Sales Number 136 90.04.E.

(iv) IMO Resolution A.694(17) can be ordered from IMO by requesting "A.694 from the seventeenth session" until it is published in the *Resolutions and Other Decisions of the Assembly of the International Maritime Organization*, 17th Session, 1991.

(2) CCIR Recommendations, ITU Radio Regulations, and CCITT publications can be purchased from the International Telecommunications Union (ITU), Place des Nations, CH-1211 Geneva 20, Switzerland.

(i) All CCIR Recommendations referenced in this Section are contained in *Recommendations of the CCIR, 1990, Volume VIII*, (ITU, Geneva, 1990), 92-61-0424104.

(ii) CCITT Recommendation E.161 is contained in *CCITT Volume II - Telephone and Network ISDN - Operation, Numbering, Routing and Mobile Service*, (ITU, Geneva, 1989), ISBN 92-61-03261-3.

(iii) CCITT Recommendation Q.11 is contained in *CCITT Blue Book Volume VI, General Recommendation on Telephone Switching and Signalling*, (ITU, Geneva, 1989), ISBN 92-61-03451-9.

(3) IEC Publications can be purchased from the International Electrotechnical Commission, 3 Rue de Varembe, CH-1211 Geneva 20, Switzerland, or from the American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036, telephone (212) 642-4900.

(4) ISO Standards can be purchased from the International Organization for Standardization, 1 Rue de Varembe, CH-1211 Geneva 20, Switzerland, or from the American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036, telephone (212) 642-4900.

(5) Copies of the publications listed in this Section that are incorporated by reference may be inspected at the Federal Communications Commission, 1919 M Street, N.W., Dockets Branch (Room 239), Washington, D.C. or at the Office of the Federal Register, 1100 L Street, N.W., Room 8401, Washington D.C.

§ 80.1103 Equipment authorization

(a) All equipment specified § 80.1101(b) must be type accepted in accordance with 47 C.F.R. Part 2, except equipment used in the INMARSAT space segment. Equipment intended for use in the INMARSAT space segment must be type-approved by INMARSAT and notified in accordance with 47 C.F.R. Part 2. The technical parameters of the equipment must conform to the performance standards as specified in § 80.1101.

(b) Applicants for type acceptance must submit with their applications measurement data sufficiently complete to ensure compliance with the technical parameters. The application must include the items listed in 47 C.F.R. § 2.983. Additional measurement data or information may be requested depending upon the equipment. For items not listed in § 2.983 of this chapter, the applicant must attest that the equipment complies with performance standards as specified in § 80.1101 and, where applicable, that measurements have been made that demonstrate the necessary compliance. Submission of representative data demonstrating compliance is not required unless requested by the Commission.

(c) Applicants for notification must attest that the equipment complies with performance standards as specified in § 80.1101 and, where applicable, that measurements have been made that demonstrate the necessary compliance. Submission of representative data demonstrating compliance is not required unless requested by the Commission. An application must include the items listed in § 2.975 of this chapter and a copy of the INMARSAT type approval certificate indicating that equipment meets GMDSS standards and includes all peripheral equipment associated with the specific unit under review.

(d) Submission of a sample unit is not required unless specifically requested by the Commission.

(e) In addition to the requirements in Part 2 of this chapter, equipment specified in § 80.1101(b) shall be labelled as follows: "This device complies with the GMDSS provisions of Part 80 of the FCC Rules."

§ 80.1105 Maintenance requirements

(a) Equipment must be so designed that the main units can be replaced readily, without elaborate recalibration or readjustment. Where applicable, equipment must be constructed and installed so that it is readily accessible for inspection and on-board maintenance purposes. Adequate information must be provided to enable the equipment to be properly operated and maintained (see IMO Resolution A.569(14)).

(b) Radio equipment required by this subpart must be maintained to provide the availability of the functional requirements specified in § 80.1081 and to meet the performance standards specified in § 80.1101.

(c) On ships engaged on voyages in sea areas A1 and A2, the availability must be ensured by duplication of equipment, shore-based maintenance, or at-sea electronic maintenance capability, or a combination of these.

(d) On ships engaged on voyages in sea areas A3 and A4, the availability must be ensured by using a combination of at least two of the following methods: duplication of equipment, shore-based maintenance, or at-sea electronic maintenance capability.

(e) Irrespective of the maintenance methods used, a ship must not depart from any port unless and until the ship is capable of performing all distress and safety functions as specified in § 80.1081.

(f) Irrespective of the maintenance methods used, all manufacturers' instruction manuals and maintenance manuals for each piece of equipment required and installed must be available on-board ship. Adequate tools, spare parts, and test equipment appropriate to the methods used by the ship as recommended by the manufacturer should be provided. The manuals, tools, spare parts, and test equipment, as applicable, should be readily accessible.

(g) If the duplication of equipment maintenance method is used, the following radio installations, in addition to other equipment requirements specified in this subpart, must be available on-board ships for their sea areas as applicable. Equipment carried in accordance with this paragraph must comply with §§ 80.1101 and 80.1103. Additionally, each radio installation must be connected to a separate antenna and be installed and be ready for immediate operation.

(1) Ships, equipped in accordance with § 80.1087 for sea area A1, must carry a VHF radio installation complying with the requirements of § 80.1085(a)(1).

(2) Ships, equipped in accordance with § 80.1089 for sea areas A1 and A2, must carry a VHF radio installation complying with the requirement of § 80.1085(a)(1) and an MF radio installation complying with the requirements of § 80.1089(a)(1) and being able to fully comply with watch requirements as specified in § 80.1123(a)(2). The MF radio installation installed for duplication must also comply with the requirements § 80.1089(c).

(3) Ships, equipped in accordance with § 80.1091 for sea areas A1, A2, and A3, must carry a VHF radio installation complying with the requirement of § 80.1085(a)(1) and either an MF/HF radio installation complying with the requirements of § 80.1091(b)(1) and being able to fully comply with watch requirements as specified in § 80.1123(a)(2) or an INMARSAT ship earth station complying with the requirements of § 80.1091(a)(1). The MF/HF radio installation or the INMARSAT ship earth station installed for duplication must also comply with the requirements § 80.1091(c).

(4) Ships, equipped in accordance with § 80.1093 for sea areas A1, A2, A3, and A4, must carry a VHF radio installation complying with the requirement of § 80.1085(a)(1) and an MF/HF radio installation complying with the requirements of § 80.1091(b)(1) and being able to fully comply with watch requirements as specified in § 80.1123(a)(2). The MF/HF radio installation installed for duplication must also comply with the requirements § 80.1091(c).

(h) The radio installations specified in paragraph (g) of this section (referred as "duplicated equipment"), in addition to the appropriate radio equipment specified in § 80.1099 (referred as "basic equipment"), must be connected to the reserve sources of energy required by § 80.1099. The capacity of the reserve sources of energy should be sufficient to operate the particular installation

(i.e., the basic equipment or the duplicated equipment) with the highest power consumption, for the appropriate period specified in § 80.1099. However, the arrangement for the reserve sources of energy must be such that a single fault in this arrangement cannot affect both the basic and the duplicated equipment.

(i) If the shore-based maintenance method is used, the following requirements apply.

(1) Maintenance services must be completed and performance verified and noted in the ship's record before departure from the first port of call entered after any failure occurs.

(2) Each GMDSS equipment must be tested and performance verified and the results noted in the ship's record before departure from every port. To accomplish this, each ship shall carry a performance checkoff sheet listing each GMDSS equipment carried on a mandatory basis.

(j) If the at-sea maintenance method is used, the following requirements apply.

(1) Adequate additional technical documentation, tools, test equipment, and spare parts must be carried on-board ship to enable a qualified maintainer as specified in § 80.1074 to perform tests and localize and repair faults in the radio equipment.

(2) Only persons that comply with the requirements of § 80.1074 may perform at-sea maintenance on radio installations required by this subpart.

OPERATING PROCEDURES FOR DISTRESS AND SAFETY COMMUNICATIONS

§ 80.1109 Distress, urgency, and safety communications

(a) Distress traffic consists of all messages relating to the immediate assistance required by the ship in distress, including search and rescue communications and on-scene communications. Distress traffic must as far as possible be on the frequencies contained in § 80.1077.

(b) Urgency and safety communications include: navigational and meteorological warnings and urgent information; ship-to-ship safety navigation communications; ship reporting communications; support communications for search and rescue operations; other urgency and safety messages and communications relating to the navigation, movements and needs of ships and weather observation messages destined for an official meteorological service.

(c) Intership navigation safety communications are those VHF radiotelephone communications conducted between ships for the purpose of contributing to the safe movement of ships. The frequency 156.650 MHz is used for intership navigation safety communications (see § 80.1077).

§ 80.1111 Distress alerting

(a) The transmission of a distress alert indicates that a mobile unit or person is in distress and requires immediate assistance. The distress alert is a digital selective call using a distress call format in bands used for terrestrial radiocommunication or a distress message format, which is relayed through space stations.

(b) The distress alert must be sent through a satellite either with absolute priority in general communication channels or on exclusive distress and safety frequencies or, alternatively, on the distress and safety frequencies in the MF, HF, and VHF bands using digital selective calling.

(c) The distress alert must be sent only on the authority of the person responsible for the ship, aircraft or other vehicle carrying the mobile station or the mobile earth station.

(d) All stations which receive a distress alert transmitted by digital selective calling must immediately cease any transmission capable of interfering with distress traffic and must continue watch until the call has been acknowledged.

§ 80.1113 Transmission of a distress alert

(a) The distress alert must identify the station in distress and its position. The distress alert may also contain information regarding the nature of the distress, the type of assistance required, the course and speed of the mobile unit, the time that this information was recorded and any other information which might facilitate rescue.

(b) The format of distress calls and distress messages must be in accordance with CCIR Recommendation 493 as specified in § 80.1101.

(c) Ship-to-shore distress alerts are used to alert Rescue Coordination Centers via coast stations or coast earth stations that a ship is in distress. These alerts are based on the use of transmissions via satellites (from a ship earth station or a satellite EPIRB) and terrestrial services (from ship stations and EPIRBs).

(d) Ship-to-ship distress alerts are used to alert other ships in the vicinity of the ship in distress and are based on the use of digital selective calling in the VHF, MF, and HF bands.

(e) Shore-to-ship distress alert relays are used by a station or Rescue Coordination Center to relay information about a ship in distress to, as appropriate, all ships, a selected group of ships, or a specific ship by satellite and/or terrestrial means. The distress alert relay must contain the identification of the mobile unit in distress, its position and all other information which might facilitate rescue.

§ 80.1115 Transmission of a distress alert by a station not itself in distress

(a) A station in the mobile or mobile-satellite service which learns that a mobile unit is in distress must initiate and transmit a distress alert relay in any of the following cases:

(1) When the mobile unit in distress is not itself in a position to transmit the distress alert; or

(2) When the master or person responsible for the mobile unit not in distress or the person responsible for the land station determines that further help is necessary.

(b) A station transmitting a distress alert relay in accordance with paragraph (a) of this section or § 80.1121(c) must indicate that it is not itself in distress.

§ 80.1117 Procedure for receipt and acknowledgement of distress alerts

(a) Acknowledgement by digital selective calling of receipt of a distress alert in the terrestrial services must comply with CCIR Recommendation 541, which is incorporated by reference.

(b) Acknowledgement through a satellite of receipt of a distress alert from a ship earth station must be sent immediately (see § 80.1119).

(c) Acknowledgement by radiotelephony of receipt of a distress alert from a ship station or a ship earth station must be given in the following form:

(1) The distress signal MAYDAY;

(2) The call sign or other identification of the station sending the distress message, spoken three times;

(3) The words THIS IS (or DE spoken as DELTA ECHO in case of language difficulties);

(4) The call sign or other identification of the station acknowledging receipt, spoken three times;

(5) The word RECEIVED (or RRR spoken as ROMEO ROMEO ROMEO in case of language difficulties);

(6) The distress signal MAYDAY.

(d) The acknowledgement by direct-printing telegraphy of receipt of a distress alert from a ship station must be given in the following form:

(1) The distress signal MAYDAY;

(2) The call sign or other identification of the station sending the distress alert;

(3) The word DE;

(4) The call sign or other identification of the station acknowledging receipt of the distress alert;

(5) The signal RRR;

(6) The distress signal MAYDAY.

(e) The acknowledgement by direct-printing telegraphy of receipt of a distress alert from a ship earth station must be given by the coast earth station receiving the distress alert by retransmitting the ship station identity of the ship transmitting the distress alert.

§ 80.1119 Receipt and acknowledgement of distress alerts by coast stations and coast earth stations

(a) Coast stations that receive a distress alert should defer acknowledgement for a short interval so that receipt may be acknowledged by a Rescue Coordination Center. Where an acknowledgement is not forthcoming within 3 minutes, the coast station in receipt of distress alerts must ensure that they are routed to a Rescue Coordination Center as soon as possible. Coast stations must provide assistance for distress communications when requested to do so by the U.S. Coast Guard. (This subpart does not specify any radio watches for coast stations.)

(b) Coast earth stations in receipt of distress alerts must ensure that they are routed as soon as possible to a Rescue Coordination Center. Coast earth stations must relay, as soon as possible, an acknowledgement of a distress alert from a Rescue Coordination Center.

(c) Certain messages must be carried without charge, regardless of the means by which they are transmitted:

(1) Distress alert messages;

(2) Search and rescue coordination messages;

(3) Medical assistance messages where an imminent danger to life is present, or

(4) Urgent meteorological or navigational danger messages passed in the ship-to-shore direction.

§ 80.1121 Receipt and acknowledgement of distress alerts by ship stations and ship earth stations

(a) Ship or ship earth stations that receive a distress alert must, as soon as possible, inform the master or person responsible for the ship of the contents of the distress alert.

(b) In areas where reliable communications with one or more coast stations are practicable, ship stations in receipt of a distress alert should defer acknowledgement for a short interval so that receipt may be acknowledged by a coast station.

(c) Ship stations operating in areas where reliable communications with a coast station are not practicable that receive a distress alert from a ship station which is, beyond doubt, in their vicinity, must, as soon as possible and if appropriately equipped, acknowledge receipt and inform a Rescue Coordination Center through a coast station or coast earth station (see § 80.1115(a)(2)). However, a ship station receiving an HF distress alert must not acknowledge it but must observe the requirements of § 80.1123, and must, if the alert is not acknowledged by a coast station within 3 minutes, relay the distress alert.

(d) A ship station acknowledging receipt of a distress alert in accordance with paragraphs (b) or (c) of this section should:

(1) Acknowledge receipt of the alert by using radiotelephony on the distress and safety traffic frequency in the band used for the alert;

(2) If acknowledgement by radiotelephony of the distress alert received on the MF or VHF distress alerting frequency is unsuccessful, acknowledge receipt of the distress alert by responding with a digital selective call on the appropriate frequency.

(e) A ship station in receipt of a shore-to-ship distress alert relay (see § 80.1113(e)) should establish communication as directed and render such assistance as required and appropriate.

§ 80.1123 Watch requirements for ship stations

(a) While at sea, all ships must maintain a continuous watch:

(1) On VHF DSC channel 70, if the ship is fitted with a VHF radio installation in accordance with § 80.1085(a)(2);

(2) On the distress and safety DSC frequency 2187.5 kHz, if the ship is fitted with an MF radio installation in accordance with §§ 80.1089(a)(2) or 80.1091(a)(3);

(3) On the distress and safety DSC frequencies 2187.5 kHz and 8414.5 kHz also on at least one of the distress and safety DSC frequencies 4207.5 kHz, 6312 kHz, 12577 kHz, or 16804.5 kHz appropriate to the time of day and the geographical position of the ship, if the ship is fitted with an MF/HF radio installation in accordance with §§ 80.1091(a)(2)(ii) or 80.1093(a) (this watch may be kept by means of a scanning receiver limited to six distress and safety DSC frequencies); and

(4) For satellite shore-to-ship distress alert, if the ship is fitted with an INMARSAT ship earth station in accordance with § 80.1091(a)(1).

(b) While at sea, all ships must maintain radio watches for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the ship is navigating.

(c) Until February 1, 1999, every ship while at sea must maintain, when practicable, a continuous listening watch on VHF Channel 16. This watch must be kept at the position from which the ship is normally navigated or at a position which is continuously manned.

(d) Until February 1, 1999, every ship required to carry a radiotelephone watch receiver must maintain, while at sea, a continuous watch on the radiotelephone distress frequency 2182 kHz. This watch must be kept at the position from which the ship is normally navigated or at a position which is continuously manned.

(e) On receipt of a distress alert transmitted by use of digital selective calling techniques, ship stations must set watch on the radiotelephone distress and safety traffic frequency associated with the distress and safety calling frequency on which the distress alert was received.

(f) Ship stations with narrow-band direct printing equipment must set watch on the narrow-band direct-printing frequency associated with the distress alert signal if it indicates that narrow-band direct-printing is to be used for subsequent distress communications. If practicable, they should additionally set watch on the radiotelephone frequency associated with the distress alert frequency.

§ 80.1125 Search and rescue coordinating communications

(a) The distress signal consists of the word MAYDAY, pronounced in radiotelephony as the French expression "m'aider". For distress traffic by radiotelephony, when establishing communications, calls must be prefixed by the distress signal MAYDAY.

(b) Error correction techniques, in accordance with CCIR Recommendation 625 as specified in § 80.1101, must be used for distress traffic by direct-printing telegraphy. All messages must be preceded by at least one carriage return, a line feed signal, a letter shift signal and the distress signal MAYDAY.

(c) Distress communications by direct-printing telegraphy should be in the ARQ mode when ships are communicating directly to the Coast Guard or other coast stations on channels which they normally guard. Other distress communications, including those on simplex channels provided for that purpose, should be in the broadcast forward error correction mode. The ARQ mode may subsequently be used when it is advantageous to do so.

(d) The Rescue Coordination Center responsible for controlling a search and rescue operation will also coordinate the distress traffic relating to the incident or may appoint another station to do so.

(e) The Rescue Coordination Center coordinating distress traffic, the unit coordinating search and rescue operations, or the coast station involved may impose silence on stations which interfere with that traffic. This instruction may be addressed to all stations or to one station only, according to circumstances. In either case, the following will be used:

(1) In radiotelephony, the signal SEELONCE MAYDAY, pronounced as the French expression "silence, m'aider":

(2) In narrow-band direct-printing telegraphy normally using forward-error correcting mode, the signal SILENCE MAYDAY. However, the ARQ mode may be used when it is advantageous to do so.

(f) Until they receive the message indicating that normal working may be resumed (see paragraph (h) of this section), all stations which are aware of the distress traffic, and which are not taking part in it, and which are not in distress, are forbidden to transmit on the frequencies in which the distress traffic is taking place.

(g) Stations following distress traffic that are able to continue normal service may do so when the distress traffic is well established and on condition that it observes the provisions of paragraph (f) of this section and that it does not interfere with distress traffic.

(h) When distress traffic has ceased on frequencies which have been used for distress traffic, the Rescue Coordination Center controlling a search and rescue operation must initiate a message for transmission on these frequencies indicating that distress traffic has finished.

(i) In radiotelephony, the message referred to in paragraph (h) of this section consists of:

(1) The distress signal MAYDAY;

(2) The call "Hello all stations" or CQ (spoken as CHARLIE QUEBEC) spoken three times;

(3) The words THIS IS (or DE spoken as DELTA ECHO in the case of language difficulties);

(4) The call sign or other identification of the station sending the message;

(5) The time when the distress situation has ceased;

(6) The name and call sign of the mobile station which was in distress;

(7) The words SEELONCE FEENEE pronounced as the French words "silence fini".

(j) In direct-printing telegraphy, the message referred to in paragraph (h) of this section consists of:

(1) The distress signal MAYDAY;

(2) The call CQ;

(3) The word DE;

(4) The call sign or other identification of the station sending the message;

(5) The time when the distress situation has ceased;

(6) The name and call sign of the mobile station which was in distress; and

(7) The words SILENCE FINI.

§ 80.1127 On-scene communications

(a) On-scene communications are those between the mobile unit in distress and assisting mobile units, and between the mobile units and the unit coordinating search and rescue operations.

(b) Control of on-scene communications is the responsibility of the unit coordinating search and rescue operations. Simplex communications must be used so that all on-scene mobile stations may share relevant information concerning the distress incident. If direct-printing telegraphy is used, it must be in the forward error-correcting mode in accordance with CCIR Recommendation 625 as specified in § 80.1101.

(c) The preferred frequencies in radiotelephony for on-scene communications are 156.8 MHz and 2182 kHz. The frequency 2174.5 kHz may also be used for ship-to-ship on-scene communications using narrow-band direct-printing telegraphy in the forward error correcting mode in accordance with CCIR Recommendation 625 as specified in § 80.1101.

(d) In addition to 156.8 MHz and 2182 kHz, the frequencies 3023 kHz, 4125 kHz, 5680 kHz, 123.1 MHz and 156.3 MHz may be used for ship-to-aircraft on-scene communications.

(e) The selection or designation of on-scene frequencies is the responsibility of the unit coordinating search and rescue operations. Normally, once an on-scene frequency is established, a continuous aural or teleprinter watch is maintained by all participating on-scene mobile units on the selected frequency.

§ 80.1129 Locating and homing signals

(a) Locating signals are radio transmissions intended to facilitate the finding of a mobile unit in distress or the location of survivors. These signals include those transmitted by searching units and those transmitted by the mobile unit in distress, by survival craft, by float-free EPIRBs, by satellite EPIRBs, and by search and rescue radar transponders to assist the searching units.

(b) Homing signals are those locating signals which are transmitted by mobile units in distress, or by survival craft, for the purpose of providing searching units with a signal that can be used to determine the bearing to the transmitting stations.

(c) Locating signals may be transmitted in the following frequency bands: 117.975-136 MHz, 121.5 MHz, 156-174 MHz, 406-406.1 MHz, and 9200-9500 MHz.

(d) The 9 GHz locating signals must be in accordance with CCIR Recommendation 628 as specified in § 80.1101.

§ 80.1131 Transmissions of urgency communications

(a) In a terrestrial system the announcement of the urgency message must be made on one or more of the distress and safety calling frequencies specified in § 80.1077 using digital selective calling and the urgency call format. A separate announcement need not be made if the urgency message is to be transmitted through the maritime mobile-satellite service.

(b) The urgency signal and message must be transmitted on one or more of the distress and safety traffic frequencies specified in § 80.1077, or via the maritime mobile-satellite service or on other frequencies used for this purpose.

(c) The urgency signal consists of the words PAN PAN. In radiotelephony each word of the group must be pronounced as the French word "panne".

(d) The urgency call format and the urgency signal indicate that the calling station has a very urgent message to transmit concerning the safety of a mobile unit or a person.

(e) In radiotelephony, the urgency message must be preceded by the urgency signal, repeated three times, and the identification of the transmitting station.

(f) In narrow-band direct-printing, the urgency message must be preceded by the urgency signal and the identification of the transmitting station.

(g) The urgency call format or urgency signal must be sent only on the authority of the master or the person responsible for the mobile unit carrying the mobile station or mobile earth station.

(h) The urgency call format or the urgency signal may be transmitted by a land station or a coast earth station with the approval of the responsible authority.

(i) When an urgency message which calls for action by the stations receiving the message has been transmitted, the station responsible for its transmission must cancel it as soon as it knows that action is no longer necessary.

(j) Error correction techniques, in accordance with CCIR Recommendation 625 as specified in § 80.1101, must be used for urgency messages by direct-printing telegraphy. All messages must be preceded by at least one carriage return, a line feed signal, a letter shift signal and the urgency signal PAN PAN.

(k) Urgency communications by direct-printing telegraphy should be in the ARQ mode when communicating directly to the Coast Guard or other coast stations on channels which they normally guard. Other distress communications, including those on simplex channels provided for that purpose, should be in the broadcast forward error correction mode. The ARQ mode may subsequently be used when it is advantageous to do so.

§ 80.1133 Transmission of safety communications

(a) In a terrestrial system the announcement of the safety message must be made on one or more of the distress and safety calling frequencies specified in § 80.1077 using digital selective calling techniques. A separate announcement need not be made if the message is to be transmitted through the maritime mobile-satellite service.

(b) The safety signal and message must normally be transmitted on one or more of the distress and safety traffic frequencies specified in § 80.1077, or via the maritime mobile satellite service or on other frequencies used for this purpose.

(c) The safety signal consists of the word SECURITE. In radiotelephony, it is pronounced as in French.

(d) The safety call format or the safety signal indicates that the calling station has an important navigational or meteorological warning to transmit.

(e) In radiotelephony, the safety message must be preceded by the safety signal, repeated three times, and the identification of the transmitting station.

(f) In narrow-band direct-printing, the safety message must be preceded by the safety signal and the identification of the transmitting station.

(g) Error correction techniques, in accordance with CCIR Recommendation 625 as specified in § 80.1101, must be used for safety messages by direct-printing telegraphy. All messages must be preceded by at least one carriage return, a line feed signal, a letter shift signal and the safety signal SECURITE.

(h) Safety communications by direct-printing telegraphy should be in the ARQ mode when communicating directly to the Coast Guard or other coast stations on channels which they normally guard. Other distress communications, including those on simplex channels provided for that purpose, should be in the broadcast forward error correction mode. The ARQ mode may subsequently be used when it is advantageous to do so.

§ 80.1135 Transmission of maritime safety information

(a) The operational details of the stations transmitting maritime safety information in accordance with this section are indicated in the ITU List of Radiodetermination and Special Service Stations and the IMO Master Plan of ShoreBased Facilities.

(b) The mode and format of the transmissions mentioned in this section is in accordance with the CCIR Recommendation 540 as specified in § 80.1101.

(c) Maritime safety information is transmitted by means of narrow-band direct-printing telegraphy with forward error correction using the frequency 518 kHz in accordance with the international NAVTEX system (see § 80.1077).

(d) The frequency 490 kHz may be used, after full implementation of the GMDSS, for the transmission of maritime safety information by means of narrow-band direct-printing telegraphy with forward error correction (see § 80.1077).

(e) Internationally, the frequency 4209.5 kHz is used for NAVTEX-type transmission by means of narrow-band direct-printing telegraphy with forward error correction (see § 80.1077).

(f) Maritime safety information is transmitted by means of narrow-band direct-printing telegraphy with forward error correction using the frequencies 4210 kHz, 6314 kHz, 8416.5 kHz, 12579 kHz, 16806.5 kHz, 19680.5, 22376 kHz, and 26100.5 kHz (see § 80.1077).

(g) Maritime safety information is transmitted via satellite in the maritime mobile-satellite service using the band 1530-1545 MHz (see § 80.1077).